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Hydraulic Mining in California.*

CONCLUDED FROM PAGE 267.

LOSS OF GOLD AND QUICKSILVER.

It is difficult to arrive at a correct estimate of the loss of gold in hydraulic washings. In mines where coarse gold predominates the loss cannot be so great as where gold in fine particles, commonly called flour-gold, constitutes the principal yield. Hydraulic mines, however, must chiefly depend on the latter gold, which is diffused through the hills and mountain-sides.

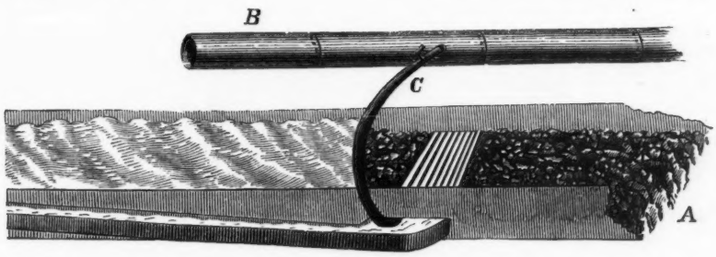

Fig. 23.—Main and auxiliary sluice-boxes. A, rock-pavement; B, large iron pipe; C, small pipe.

The loss of quicksilver in the best-conducted hydraulic mines is from 12½ to 15 per cent., and the loss of gold, in many cases, can hardly be less. Even if almost all the heavier particles of bright gold are saved, still there is in all mines a proportion of rusty gold, which is not attacked by quicksilver, and is very liable, on account of the reduction of its specific gravity by the adherence of foreign matter, to be carried off in the sluice-stream.

In most cases tailings of a hydraulic mine become public property, and are therefore a total loss to their original owners. How great this loss is may be evidenced by the yield of only a small portion of these tailings under subsequent working.

There can be no doubt whatever that generally too much gravel is washed for the supply of water. We need only to argue from the most primitive mode of gold-washing, namely, the washing with the pan, to gain the strongest proof that by the washing of enormous quantities of gravel in a stream of thick and muddy water great quantities of the finer particles of gold are lost. To save such gold in a pan requires not only a skillful hand, but a change of water, so as to offer the least resistance to the settling of the particles at the bottom of the pan. Considering, then, how easy it is to carry on certain mechanical operations on a small scale, which are altogether impracticable on a large one, we must conclude that the difficulties of saving the flour-gold in enormous sluices, running rapid streams of thick and muddy water, must be increased, though not, perhaps, in direct proportion to the difference between the quality of material washed. That it is desirable to extract the gold as completely as possible from the gravel-deposits, which, though immense, are nevertheless exhaustible, needs no demonstration; the only means will be a greater supply of water. With an ample supply of water, a system of sluices could be introduced which would separate the finer gravel, black sand, etc., from the main stream and carry this finer stuff, with a new supply of pure water, alongside the main sluice. A medium grade of 6 inches to 12 feet of the main sluices would suffice not only to carry out such a system of separation, but to establish under-currents and drops for finer gravel, even to a greater extent than the present system of sluice-washing permits.

We will suppose that sluice-boxes on a grade of 6 inches per 12 feet and for a distance of 5,000 feet are established; that, furthermore, the natural fall of the main outlet permits no higher grade.

At the point where main sluices leave the tunnel, (the length of which is immaterial,) a grating, such as described under the heading of under-currents, is inserted in the bottom, flush with the pavement of the sluices. The bottom of the main sluice, below this grating, which may be from 15 to 18 inches in width, forms the bottom of the box which receives the water, fine gravel, etc., falling through the grating. To give fall to this box, a false bottom on a grade of ½ inch per foot is inserted. This box leads into (or is continued in the form of) a smaller sluice-box, running alongside the main sluice and on a grade of only 4 inches per 12 feet.

To facilitate the flow of this strained material, and to make up for the loss of grade, a jet of pure water is injected by a small pipe into the receiving-box below the grating, assisting thus in keeping this box clear and in washing the strained gravel, etc., in a pure stream of water.

Figure 24 represents the sluices running on a higher grade than 6 inches to 12 feet, to make the difference in grade which exists between the two sluice-boxes more prominent and perceptible.

A represents the rock pavement in the main sluice-boxes flush with the grating.

B is an iron pipe, large enough, to supply streams of pure water in sufficient quantities, when necessary.

C is a smaller pipe, leading a jet of water into the box below the grating.

The small sluices, containing the strained gravel-wash, will gain, in a run of 250 feet, about 3 feet and 6 inches height over the main sluice-boxes, the former running on 4 inches and the latter on 6 inches grade to the 12 feet. At this point—250 feet from the first tap—another grating and small sluice-box is established as before. At the same point the platform of an under-current, 36 feet long and of any desirable width, running on a grade of 12 inches per 12 feet, or 1 inch per foot, can be constructed. This platform connects at its lower end with the second smaller sluice-box, and empties its contents into that box, which needs to be enlarged sufficiently to carry, in a shallow stream, all the gravel and water received. It is supposed that another jet of pure water has been tapped from pipe B, and applied as before mentioned. It will hardly be necessary to say that all these arrangements should be carried on far enough from the main sluices not to interfere with them except at those places where the tapping takes place.

Fig. 25. A. First tap, running 250 ft. and gaining 3 ft. 6in. over grade of main sluices.

B. Second tap from main sluices, 3 feet 6 inches lower than the first.

C. Platform of under-current, on 1 inch per foot grade, and 36 feet long.

D. Widened boxes, running on 4 inch per 12 feet grade.

E. Main sluice.

We have here, then, in a distance of 250 feet, and without loss to the grade or elevated position of the main sluices, an under-current of 36 feet length and 1 inch per foot grade; and we can repeat the arrangement for every similar distance, and without losing control of the strained gravel, etc., which is carried onward independent of the mass of material in the main sluices.

The finer gravel, which is gradually extracted from the main sluices, must be collected into one box, increased in size as new tributaries empty into it. Considering that only very fine gravel, with an increased supply of water, is carried by these boxes, they may be made very wide, so as to permit the gravel and sand to spread and run in a thin stream.

To regulate the overflow, triangular checks, as represented in the platform C in the last sketch, may be used, one of the angles turned toward the stream.

If a drop is preferred, from time to time, instead of an under-current, or its platform, a very strong and tight box should be placed below, and a few feet lower than the actual drop.

To the bottom of this box a strong iron pipe, 1 or 2 inches in diameter, may be adjusted, being, at the same time, connected with the supply-pipe which furnishes the water along the line of sluices.

This water is supposed to be subject to any desirable pressure and might be used at these drop-boxes under enough pressure to keep the quicksilver and other matter in the drop-box in perpetual motion, and thus assist in the liberation and amalgamation of the gold.

A further sifting or reduction in size of the gravel can be accomplished by straining it through a grating with ½ inch interstices between the bars; the refuse matter may either be thrown at once into the main sluices, or, in case an

* By Mr. CHARLES WALDEYER, of Cherokee, Butte County, California, in Prof. RAYMOND'S Report on the Mineral Resources West of the Rocky Mountains, 1873.

abundance of water is at hand, carried in a separate box to the place of general deposit. Should the refuse pebbles be thrown back into the main sluice, all future gratings in the latter must be fine enough to retain these refuse pebbles in the main sluices, and thus to prevent useless shifting of material.

The water which the main sluice loses by the repeated tapping must be supplied by pure water from the supply-pipe. The size of the main flume or sluice must also be reduced as the water stream and solid material lessen.

It would be advisable to supply all the sluices for the finer or sifted gravel

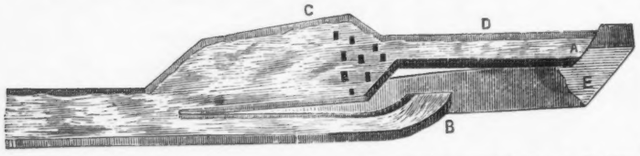

Fig. 24.—Arrangement of undercurrent, (perspective distorted to show details.) A, first tap, B, second tap; C, platform of undercurrent; D, widened boxes; E, main sluice.

with riffles made of 2 by 3 inch scantlings, which are not only considered the best gold-catchers, but are easily removed and replaced, and durable enough for the washing of fine gravel.

In the history of gold-mining the *washing process* can claim priority over all others, no matter whether the gold was found in the sands of a river or in a solid ledge of quartz. If in the latter, the solid quartz was first reduced to sand, and then treated like river-sand by washing over sloping platforms covered with blankets or skins, in which the small particles of gold settled, while the lighter sands flowed off with the water.

The platforms of our under-currents are only a repetition, on a far larger scale, of the above-mentioned primitive mode of gold-washing, and they illustrate well the soundness of the principle: *to pour the gold-bearing matter in a shallow stream over an inclined platform, provided with a rough surface, on which the small particles of gold can be caught.*

Being then forced to acknowledge that a broad and shallow stream facilitates the catching of gold, we must ask, *why are all our sluice-boxes not constructed on the principle of under-currents, wide and shallow?* The answer is, that the heavy and large material, (bowlders and pieces of hard clay or cement,) needs a deep current of water to carry it along.

If, therefore, a separation of the finer gravel from these bowlders, etc., were effected, no reasonable obstacle would remain to the application of that principle in gold-washing which has been sanctioned by the practice of thousands of years, and which our modern time, with all its advances in science, cannot improve, but only imitate.

The practicability of such an application in gold-washing, even for the largest hydraulic operations, may be illustrated by the subjoined sketch, (Fig. 25) which, though not executed with regard to proper proportions, represents, with sufficient clearness, a section of main flumes, or sluices, running on a grade of 6 inches per 12 feet, and tapped every 250 feet for its whole length.

The distance between tap I and tap II would, therefore, be 250 feet, and between tap I and tap III 500 feet. The platforms have only a grade of 4 inches per 12 feet, and the gain in height by this lessened grade would be for a distance of 250 feet about 3½ feet, which gain is spent in a drop at tap II, where a larger platform receives the strained gravels of taps I and II. Where the gravel and water drop off, is inserted a deep, strong box, well charged with quicksilver. To the bottom of this box an iron pipe is led, which discharges a stream of water under a regulated hydrostatic pressure and in adjustable quantities.

In this way the quicksilver would be kept always in motion, and the gravel itself would be subjected to an excellent crushing process. (See sketch, pipe 1.) Pipes 2 and 3 inject streams of pure water under the grating to keep the box clear, and to supply also more water to wash the gravel over the widened platforms.

This process may be repeated for the whole length of the sluice-boxes. The size of the gravel may be reduced by repeated straining, as described above.

The undeniable advantages of this mode of working can be stated in a few words:

First. All the fine gravel and sand, in which most of the fine or rusty gold is carried off, will be submitted to a continuous washing over under-current platforms, without ever being returned to the main sluices. The reduced grade on these platforms is equalized by an addition of pure water, which will permit an easier settling of the gold than a swift and muddy stream.

Secondly. Repeated drops, connected with a strong hydraulic jet, will do a great deal for the scouring of rusty gold, and the general breaking up of the washed material.

Thirdly. A reduction of the gravel to the smallest size can be easily attained by repeated straining, as mentioned before, so that the largest pebble would only equal a pea in size.

To prevent this fine gravel-wash from "baking," requires only a very simple arrangement. A frame-work, resembling a common harrow, can be placed on the top of the platform, the teeth downward, and touching with their points the riffles of the platform. This arrangement would secure the breaking of the stream at a hundred or more points, and could be removed and replaced at a moment's warning. (See Fig. 25.)

Where motive power can be procured as easily as on large sluice-boxes running a large and rapid stream of water, this harrow might be put in slow motion by an under-shot wheel, the frame of the harrow running on rollers upon the sides of the platform.

This sort of machinery is the simplest in construction, and could be used, perhaps, with great beneficial effect, and without that wear and tear which any more complicated machinery would suffer by the treatment of such an enormous

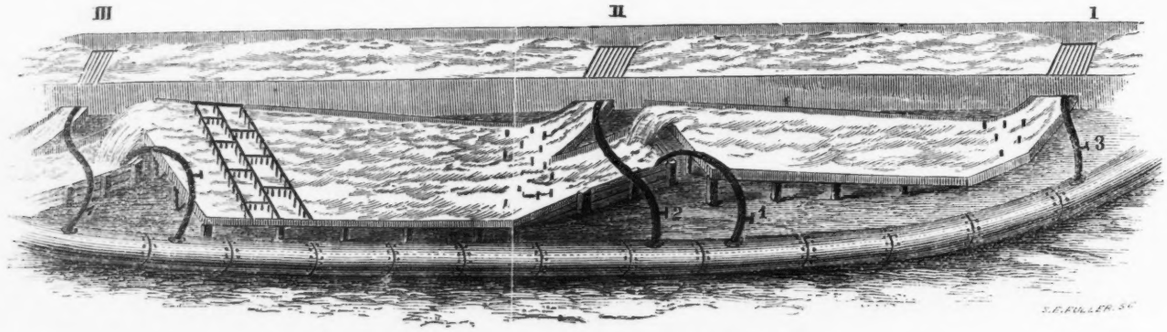

Fig. 25.—Sluice-washing of the future. I, II, III, taps; 1, 2, 3, auxiliary jets.

quantity of material as continually passes over the long line of platforms.

The writer submits the foregoing suggestions, trusting not only to gain the favorable judgment, but also to arouse the inventive energy of those to whom we owe already the present advanced condition of the art of hydraulic mining.

Tests of Vulcanized Rubber Belts.

CHEMICAL analysis, in the majority of cases, is powerless to determine the quality of vulcanized rubber, and the consumer is usually left to mechanical tests of the article furnished him, in comparison with other and similar products of known excellence, in order to find out whether the former is adapted to his purpose or attains a fixed standard of efficiency. These trials consist in examining the comparative degrees of elasticity and tenacity. The manner in which they are conducted in the French navy appears to us practical and easily followed. The first test consists in cutting from the sheets samples, which are left in a steam boiler under a pressure of 5 atmospheres for 48 hours. At the end of this time, the pieces should not have lost their elasticity. The specimens may then be placed on the grating of a valve box, under a pressure from above of 85·5 lb. per square inch, and should withstand 9,100 strokes at the rate of 100 per minute. Specimens not boiled should withstand 17,100 strokes. Thongs of rubber boiled, and having a section 0·6 inch square and a length of 8 inches, fixed between supports and elongated 3·9 inches, should resist without breaking a further elongation of 8 inches, repeated 22 times a minute for 24 hours. Thongs not boiled, under the same conditions, should resist for 100 hours. These extra elongations may be easily made by a wheel, to the periphery of which one end of the thong is fastened, while the other extremity may be attached to a support. By turning the wheel, any determined elongation may be given at the rate of from 20 to 25 times per minute. Under the above conditions bands of first quality rubber, perfectly pure and well vulcanized, break after 180 or 200 elongations of 8 times the initial length. Bands cut from pure rubber, but of secondary quality, break after 50 or 60 elongations. Inferior caoutchouc, containing mineral matters or residue of vulcanized rubber, gives no results at all.

M. OGIER (from whose valuable paper, recently read before the Paris Society of Civil Engineers, we extract the main facts of this article) has investigated the properties of rubber belts made of repeated layers of cloth covered with prepared rubber. Through the adhesive nature of the caoutchouc, the superposed tissues form, after vulcanization, a homogeneous substance, comparable, in M. OGIER'S opinion, to the best curried leather. His experiments, in order to obtain the coefficient of friction of these belts on cast iron pulleys, give us results varying from 0·42 to 0·84, as against the coefficient for leather, 0·28. The minimum value corresponds to canvas and rubber belts without an exterior rubber coating. On pulleys of various forms, the maximum value of the coefficient of

friction was found on those slightly convex and presenting a roughly turned surface, this result being inverse to that obtained with leather belts. Similarly, the presence of fatty bodies has an opposite action on the cloth and rubber belts to that which it has on leather. On covering the former with a light varnish of half olive oil and half tallow, the adhesion was found to be considerably augmented. This fact M. OGIER, who does not counsel the use of the varnish but for rubber-coated belts, attributes to a resinification resulting from an action on the mixture of the excess of sulphur, which the caoutchouc always rejects after a certain period.

Experiments were also instituted on leather and rubber belts, in order to determine their resistance to rupture, and the law of elastic and permanent elongations obtained under increasing stress. These trials were made on belts 117 inches long, suspended from a crane by jaws, and carrying at their lower extremities other jaws which sustained the weight. Both pairs of jaws grasped the leather for a sufficient distance to preclude any possibility of slipping. The belts were allowed to remain under stress for an hour and a half before the elongations were measured. The results obtained may be summarized as follows: 1. The resistance to traction of rubber and canvas belts per square millimeter (0·0009 square inch) of section is at least equal to that of leather belts. 2. This resistance per square millimeter is independent of dimensions—length, breadth, or thickness. Such is not the case with leather belts, and therefore preference should be given to rubber belting whenever the conditions of the power to be transmitted necessitate the employment of very long, very wide, and very thick belts. 3. From two trials it appears that the external covering of caoutchouc adds nothing to the resistance, and hence it is advantageous to use covered belts which, at equal weights and prices, give a superior resistance. 4. Under the same weight, the elastic elongation of leather belts is double that of rubber ones. The permanent elongation, under a change of 0·55 pound per square millimeter, reached 2 per cent. in the former and nothing in the latter.

This last fact is worthy of special note, since the lack of success of rubber belting, in many cases, may be traced thereby to the fact that a workman, used to leather belting, treats rubber naturally in the same way. He tightens the latter when it slips, a proceeding which results in breakage or rapid destruction through use at too high a tension. M. OGIER concludes that, in the present state of the leather and rubber industries, the price of installation, useful effect being considered, of leather and rubber belts is about the same, but the cost of maintenance of the latter is small when compared to that necessitated by the use of leather belts of large dimensions.—*Scientific American.*

Notes.

Steel Company of Canada.—A quantity of heavy machinery for the Canada Steel Works, at Londonderry, arrived in the steamer "Moravian" from Liverpool. Halifax *Chronicle.*

Use of Timber in Mines.—Timber is being buried in the Consolidated Virginia mine at the rate of 6,000,000 feet per annum, and in all other mines in like proportion. The Comstock lode may well be said to be the tomb of the forests of the Sierras.

The Threatened General Strike in the Connellsville coke region will most probably be averted. At present there are several local strikes for various causes, but on the whole good feeling prevails and the trade is brisk.—*Frank Cowan's Paper.*

Preservation of Wood.—M. ROTTLER, private tutor of the University of Ghent, has recently brought before the Académie Royale de Belge the results of his experiments on the preservation of wood by different salts of copper. He finds that the salts of copper and ammonia are by far the most effective.

The Quantity of Bessemer Steel Ingots Made in England for the past five years is given as follows, by competent authority, in gross tons: In 1870, 215 000 tons; 1871, 329,000; 1872, 410,000; 1873, 496,000; 1874, 540,000. We are indebted for this information to the courtesy of Z. S. DURFEE, Esq., Secretary of the Pneumatic Steel Association.—*Bulletin.*

A New German Powder Factory.—*Galignani* mentions a rumour that in addition to the four powder mills of the German Empire, at Spandau, Meissen, Metz, and Munich, a new factory is to be constructed at Hanau, in Hesse, for the manufacture of a newly-invented species of that explosive, which is reported to be superior to any variety hitherto fabricated.

Improved Mining Lamp.—The object of the invention of Mr. W. E. TEALE, of Manchester, is, firstly, to provide greater security against the opening of lamps while a light is burning therein, by means of an extinguishing tube which is brought over the light before the lamp can be opened; and, secondly, to light lamps, after being securely fastened, by a current of electricity being passed through the inflammable vapors used in such lamps.

Taking Tracings.—Herr TUSCHER says that if one volume of castor-oil be dissolved in two or three volumes of spirits of wine it will render paper transparent, and the spirit rapidly evaporating, the paper, in a few minutes, becomes fit for use. A tracing in pencil can then be made, and if the paper is placed in spirits of wine, the oil is dissolved out, restoring the paper to its original condition. The drawing may then be completed in Indian ink or in colors.

Gold Production of Nova Scotia, 1874.—From the report of HENRY S. POOLE, Inspector of Mines, we glean the following: The average number of men employed was 246; there were 21 crushing mills, 11 of which were driven by steam and 10 by water power; there were 13,844 tons of quartz crushed, yielding 9,140 oz. 13 dwts. 9 grs. of gold, or an average of 13 dwts. 5 grs. per ton; the highest yield of any one mine was 19 oz. 12 dwts. 22 grs.; the average yield per man, for twelve months, at $18 per oz., was $664 76.

Howatson Puddling Furnace.—This new furnace has lately been put up, by way of trial, at the Liverdun Ironworks. The air necessary for the combustion is previously heated by circulation across flues contrived in the masonry itself of the furnace, and is then led into the fire-grate both above and below the bars. The consumption of fuel, which was formerly from 850 to 900 kilogrammes (16 cwt. 2 qr. 26 lb. to 17 cwt. 2 qr. 24 lb.) of Saarbrück coal per ton of puddled iron, is now found to be reduced by more than 100 kilogrammes (1 cwt. 3 qr. 24 lb.), that is to say, by 11 to 12 per cent.; and it is hoped that the saving will even reach 20 per cent. It appears that this important economy in coal has been proved by very exact comparative experiments.—*Annales Industrielles.*

Smelting of Iron Ores with Lignite.—R. VON REICHENBACH in the *Berg- und Hüttenmännische Zeitung.*—The author, after reviewing the projects of GERSTORFF, WAGNER, MIETSCH, KERN, SIEMENS, and others, for solving this problem, goes on to propose the following plan: 1st. For the older lignites, a blast-furnace of moderate height, with very hot blast (to prevent a sintering of the coal.) 2d. With the more recent lignites, to dry them so as to expel all hygroscopic and chemically combined water, and to use these also in low furnaces. 3d. To carry on further experiments as to the coking of the lignites. 4th. Where there are large quantities of fine coal, to use this in one shaft for the reduction of the ore, which is then to be smelted in another shaft with the coarser coal. 5th. In case the preceding methods are not successful, to try a partial or total treatment of the ores with gas produced from the lignites in generators.

Chicago Coal Exchange.—At the annual meeting of the Chicago Coal Exchange, on the 6th of April, the Secretary reported that the Exchange numbered fifty five members, representing as many firms. The total receipts of anthracite coal during the last season were 395,680 tons. To this add about 100,000 tons, held over from the previous season, and there was a round total of 500,000 tons in the available stock in the trade for the year ending May 1, 1875. The total sales for the year might be safely stated at the same amount. The receipts by lake during the season of bituminous coal were 261,795 tons, which, it was expected, would be completely disposed of before the close of the season. By this result it would seem that, for the first time in years, the coal dealers were rendered quite independent of the dock owners. The following officers were elected for the ensuing year: President, O. W. GOTT; First Vice Pres., J. H. LITTLE; Second Vice Pres., M. E. JOHNSON; Tres., ROBERT LAW; Secy., J. KIRKLAND. Directors: J. A. STONE, M. DUNNE, E. W. MORLEY, B. M. CROSBY, PETER TAYLOR, D. M. MCGARRY and C. C. MARDER.

Mines and Minerals in Russia.—The *Golos* gives some interesting details respecting the mining operations and mineral productions of Russia during the year 1874. The State foundries smelted 1,225 000 Russian pouds of bronze, 557,000 pouds of iron, and 1000 pouds of steel; 89,000 pouds weight of articles in bronze were cast, and 508,000 pouds weight of ammunition, 9000 pouds weight of steel cannon, and 15,000 pouds weight of iron cannon. 15,000 pouds of lead and 6600 pouds of zinc were smelted. 7800 pouds weight of iron articles, 10,000 pouds weight of sheet iron, and 7500 roubles worth of iron for use in shipbuilding were also made, besides 46,700 side arms, 20,000 blades, and 5725 gun barrels. The amount of metal passing through private factories can only be approximately calculated, as the year is reckoned from May 1 to April 30. The following return, however, is supposed to tolerably correct. The productions of the smelting establishments of the Ural are estimated at 13.200,000 pouds of bronze, 1,017,000 pouds of iron, 69 000 pouds of steel, and 100.000 pouds of copper. Those round Moscow are supposed to have produced 3,360,000 pouds of bronze and 1,830,000 pouds of iron. South Russian produce is estimated at 430,000 pouds of bronze and 440,000 pouds of iron; that of the Polish Provinces at 1,370,000 pouds of bronze, 800,000 pouds of iron, and 120,000 pouds of zinc. Lastly, 44,000 pouds of copper is calculated as the return from the Caucasus. Gold to the amount of 1806 pouds has been extracted during 1874, without reckoning the districts of Altaï and Nerchinsk, which yield an annual average of 165 pouds. Coal has been worked with increased progress in every district except that of the Vistula, which is still suffering from the effects of the conflagrations of 1873. The total amount of coal and anthracite raised in 1874 was 83,575,000 pouds, the largest portion coming from the government of Catherinoslaw, the district of the Don Cossacks, the neighborhood of Moscow, and from private mines. The extraction of mineral oils in the Caucasus shows a great increase, and oil wells have lately been discovered in Poland in the government of Kielce. A Russian poud is equal to about 36lb English weight.

Quicksilver Statistics.—Last week we published some statistics going to show that the world's production per annum was 80,000 flasks, and the world's consumption 83,000 flasks. The scanty supply of the past few years has been the occasion of using up the heavy stocks that had long been accumulated and piled up in the Old World, while California's production has of late accumulated so rapidly that holders are again forced to export it abroad, valuing the same at Custom house at $1, although sales have been made during March as low as 75c. The article can be produced here at a profit for 40c. to 50c. The receipts during the past month have been greater than for a like period in years past, and probably greater than they will be again for some time to come, owing to the great decline in prices here, in London, and elsewhere—say in New York $1 15@$1 20 per lb.; London, £15@16 per flask; and here, 75@85c., according to quantity. Exports for the week embrace the following per steamer *Granada:* 100 flasks for Liverpool via Panama, and 126 flasks to Mexican ports.

Exports by sea for the past three months compare as follows:

	1874		1875	
To	Flasks.	Value.	Flasks.	Value.
New York	25	$ 3,000	12	$ 1,423
Mexico	1,345	125 435	1,870	163,161
South America	300	28,688	820	88,369
New Zealand	31	3,050	10	612
Japan	..	....	100	10,814
Australia	..	....	92	8,574
China	..	....	620	69.518
England	..	....	100	7,650
Totals	1 701	$160,173	3,624	$350,121
Increase this year	1,923	189.948	....	....

Same period, 1873, 2,040 flasks, valued at $141,623; 1872, 2,159 flasks, valued at $179,350; 1871. 3,685 flasks, valued at $221,940. Overland shipments for the first quarter of 1873, 119,880 lb. gross; for 1874, 127,188 lb. gross.

Receipts for the past three months compare as follows:

	Flasks. 1874.	Flasks. 1875.
January	997	1,607
February	1,709	3,593
March	1,830	4.244
Totals	4,536	9,444
Increase this year	4,908	....

San Francisco *Commercial Herald*, April 1st.

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RICHARD P. ROTHWELL, C. E., M. E., } Editors.
ROSSITER W. RAYMOND, Ph. D., }

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Ores and Minerals for the Centennial.

A CONSOLIDATION.

WE understand that the Committee of the Philadelphia Academy of Sciences on the collection of ores and minerals for the Centennial has resolved to co-operate with the Smithsonian Institution, and will soon issue a circular explaining particulars. We can but rejoice in this step towards unity of action, as largely increasing the prospects of success. The Commissioner of Mining Statistics and his assistant, Mr. EILERS, have undertaken to obtain for this enterprise representative samples of ores and minerals from the far Western States and Territories ; and this they will doubtless be able to accomplish through their numerous agents, correspondents and acquaintances, scattered through the mining camps of the Pacific Slope. *

Mining Statistics, Reports.

THE Commissioner of Mining Statistics desires us to state, as a sufficient answer to numerous letters of inquiry addressed to him, and a possible preventive against the multiplication of such letters, the exact condition of the work under his charge.

Congress voted, just before adjournment, three things with regard to this matter : viz. the money to carry on the work, which, according to the provision of the Appropriation Bill, is to be finished on or before June 30, 1876 ; also, the order to print an extra edition of the report of 1874, (i. e. rendered in that year) for general distribution ; and finally, a similar edition of the report rendered in February last, and now in manuscript, awaiting publication.

The full series of reports may be tabulated as follows :

No.	Author.	Date.	For the Year.	Remarks.
1	BROWNE	1867	1866	Scarce
2	"	1868	1867	"
3	RAYMOND	1869	1868	"
4	"	1870	1869	Very scarce
5	"	1871	1870	" "
6	"	1872	1871	Obtainable
7	"	1873	1872	"
8	"	1874	1873	Soon obtainable
9	"	1875	1874	To thcoming

The Commissioner has a few copies of No. 6 (RAYMOND's fourth annual report) which can be obtained on application by parties who are interested in mining. Each applicant should inclose 50 cents to pay for postage, wrapping, etc. Of No. 7 the supply on hand is still larger, amounting to more than a hundred copies. It is the Commissioner's duty and pleasure to put these books where they will be properly used, in accordance with the design of Congress in voting him a supply of them. We regret to say that the provision made for Nos. 8 and 9 is far less liberal. It is doubtful whether the Commissioner will have any copies for general distribution, since the supply, instead of being 1,000 copies for his use, as it was in 1873, is only 250 copies "for the Treasury Department *and* the Commissioner," and the latter may count himself fortunate if he is able to furnish copies to his own agents and correspondents, and the contributors to the reports. An indiscriminate taste for economy is a cruel thing, sometimes ; and it is especially mortifying to be obliged to have many scientific and professional private or public libraries with incomplete sets of such documents, just because Congress feels like printing 15,000 copies one year, 10,000 the next, 7,500 the next and 4 000 the next. However, the successive volumes of the Census were served the same way, to the great disgust of Prof. WALKER, the accomplished superintendent, and the complete disarrangement of his careful plan of distribution. It is one of the incidents of republican government, and we must grumble and endure it, as becomes good citizens. *

Phosphuretted Steel.

A YEAR or two ago, it was generally admitted that a pure ore or pig iron, and especially one containing less than 0·03 to 0·05 of phosphorus, was absolutely essential to the production of a good Bessemer steel ; the consequence has been that many of our richest iron ores, most cheaply mined and supplied, have been ruled out as unfit for Bessemer work. Such are most, if not all, of the limonite and fossiliferous ores of Pennsylvania, Virginia, Tennessee, Georgia and Alabama in which the percentage of phosphoric acid runs usually from 0·05 to 0·15 per cent., corresponding to about double these amounts in the pig iron. This small percentage of phosphorus has been a perfect bugbear to iron manufacturers, and so important was it considered that one of our large steel works imported 10,000 tons of ore from Algiers at a cost of about $16 per ton, because it was, at that time, impossible to procure ores here sufficiently free from phosphorus for use in the manufacture of steel rails. Innumerable efforts have been made to get rid of the phosphorus in the several processes through which the iron passes in its manufacture, but these efforts have been but partially successful, and then only in the puddling process, and, consequently, of no use in the manufacture of Bessemer steel.

Investigations which have been made during the past two or three years have developed the fact that by a kind of homœopathic treatment (*similia similibus curantur*) certain substances which themselves give hardness and brittleness to steel may be in part substituted for other ingredients having a similar tendency, to the great improvement of the resulting metal. It has thus been found that by securing proper relative proportions of carbon, phosphorus, silicon, and manganese a steel of great softness and strength can be obtained, while the same percentage of phosphorus in ordinary steel would have indicated very different properties.

There is no longer much doubt of the fact that manganese exerts upon steel a body-giving and toughening influence as well as a neutralizing effect on the hardening or cold shortening due to phosphorus. Though these properties of manganese have been blindly suspected for some time, the mutual dependence and, to a certain extent, interchangability of carbon and phosphorus were not fully appreciated till the success of M. TES-IÉ DU MOTAY in producing with ferro-manganese a good rail steel containing about .12 carbon, .25 phosphorus and .75 manganese, was fully established.

The secret of success appears to be in putting into the metal from ½ to 1 per cent. of manganese without bringing the percentage of carbon above .16, while the metal contains the ordinary amounts of phosphorus and silicon, or, say, .25 to .29 of the former and .03 of the latter. When the percentage of phosphorus is diminished that of carbon should be increased, and *vice versa* within certain limits. We have published, vol. XIX p. 36 and p. 68 of this journal, a description of the process of manufacture of both rail and plate steel by the use of ferro-manganese, and of the tests applied and sustained by the product at the Terre Noir works. It is not necessary to repeat these, but the importance of the subject to our ironmasters justifies a further reference to the successful use of ferro-manganese containing about 50 per cent. of manganese in the manufacture of these soft steels. Steel is undoubtedly destined to supplant iron for almost every use where the latter is now adopted. It is of the utmost importance that our ironmasters should seek out and apply those improvements in its manufacture, that will enable them to make use of our unrivalled advantages in the abundance and cheapness of our iron ores and fuels, and thus place us in a position to compete successfully in other markets than our own.

Coal Mining in Nova Scotia in 1874.

THE excellent report of HENRY S. POOLE, Inspector of Mines in the Province of Nova Scotia, besides the usual dry statistical details of the production of minerals, contains many remarks and suggestions of interest beyond the limits of Nova Scotia. The report is characterized throughout by accuracy, care and good judgment, and without being a pretentious document will doubtless be of benefit to the mining industries it represents. The following table gives the amount and value of the minerals produced in the province during the year 1874, as compared with the corresponding items in 1873 :

Number of mines. 1873.	1874.	Minerals.	Quantities. 1873.	1874.	Values. 1873.	1874.
28	30	Coal tons of 224 lb.	1,051,467	872,720	$2,699,347	$2,787,098
33	33	Gold 1873, 17,708 tons quartz 1874, 13,844 " " oz.	118,552.4	9,141	219,270	164,538
3	2	Iron ore.....tons.	3,485	2,469	10,455	7,407
	12	Plaster.....	120,693	104,140	120,693	104,140
	10	Freestone (grindstones, etc.).....	2,820	8,829	34 532	40,313
	1	Limestone		448		537
		Moulding sand	130	300	260	600
					$3 084,557	$2,104,633

These figures show a falling off in almost every item of production, which is

exceedingly discouraging, and which in the aggregate amounts to nearly *one third* of the total value of the minerals raised in the preceding year.

This enormous decline is attributed, except in the item of gold, to "the general dullness of trade" during the year.

The following Table gives the production of Coal by Counties, and the destination of the coal.

Destination.	Cumberland.		Pictou.		Cape Breton.		Victoria.		Grand Total.
	Round.	Slack.	Round.	Slack.	Round.	Slack.	Round.	Slack.	
Nova Scotia	3,197	782	84,811	22,180	86,307	15,207	2,439	36	214,965
Quebec	..	..	114,119	2,069	45,129	333	619	..	162,269
New Brunswick	34,128	8,325	7,216	2,681	26,300	191	..	..	78 841
Newfoundland	..	..	1,946	84	52,507	144	1,003	12	55,696
P. E. Island	..	..	11,985	23,182	6,144	160	477	..	41.948
United States	3,167	..	55,536	5,383	65,578	8,671	..	..	138,335
West Indies	..	..	21,362	..	26,482	..	..	..	47,844
South America	..	..	4,389	..	688	..	..	..	5,077
Europe	..	..	977	..	3,175	..	..	..	4,152
Colliery, Engines.	Round & Sl'k, 2,206			29 897		43,430		661	76,194
" Workmen	" " 647			17,753		24,792		196	43,388
Unaccounted for.	..	..	..	..	..	..	..	..	4,011
Stock on hand December 31, 1874, 93,000 tons,								Total,	872,720

We learn further, that to produce these 872,720 tons there were employed as follows:

Underground, cutters	1,581	Average No. of days per person surface	232
laborers	428	Average No. of tons per cutter per day	2.5
boys	349	No. of horses underground	221
Surface, mechanics	453	" " on surface	179
laborers	923	*Accidents.*	
boys	193	Number of fatal accidents	6
Construction, persons	355	Lives lost	7
Total persons employed	4,282	Persons employed per life lost	611
Days labor	955,722	Tons raised per life lost	124,674
Average No. of days per person underground	213		

Though the production of coal has diminished during the year, the above figures show that the loss of life has been reduced in a much greater proportion; an indication, let us hope, of greater skill and care in the working of the mines; if the exercise of these should result in reducing materially the cost of mining, there may be some hope of a larger business with this country; at present prices that prospect is exceedingly bad, and our neighbors should look to the Dominion and other foreign markets, rather than to the United States, for a market. Up to the present time no important contracts have been made for Provincial coals, and the prospect is less favorable than even last year.

Mr. POOLE calls the attention of the Nova Scotia coal masters to the advantages that may result from the introduction of coal-cutting machines, rock drills, diamond drills, dynamite or other strong explosives, improvements in the handling of coal to prevent breakage, and many other subjects of practical importance. The use of portable fire extinguishers in mines, especially in the case of fiery mines has been found advantageous there as here. As a rule, the Nova Scotia mines do not produce fire-damp to anything like so great an extent as some of our anthracite mines, but sufficient, nevertheless, to make it necessary to pay great attention to the question of ventilation. We believe the use of furnaces underground, which is general in the Province, for ventilating purposes, will be found the fruitful source of accident and expense when the mines become more extensive and more fiery. It is almost impossible to make a fire in a coal mine "perfectly safe." And it would require stronger reasons and greater advantages than are apparent, to justify incurring the risk of that most expensive of all accidents, a mine fire.

We note also the more general adoption of direct acting steam pumps at these mines. At the Nova Scotia Colliery there is a pump of this kind having a 20 inch steam cylinder and 6 inch plunger, forcing water 560 feet high through 1150 feet of a column pipe. The exhaust steam is discharged into the suction pipe, by which, it is claimed, there is a saving of power; the same device has been adopted with advantage at the Sterling Pit at Glace Bay.

Mr. POOLE calls attention to an important point when he speaks of the desirability of popularizing the use of coal slack. Base burning stoves, on nearly the same principle as the anthracite base burners, have been successfully used for burning bituminous slack in the Western States, and we have also heard of Nova Scotia slack being used in Boston during the present season, and with very satisfactory results.

The introduction of machinery for washing fine coal, and its manufacture into coke for the use of iron and other metallurgical works, appears to be a solution of the problem which is probable in the near future. The Cape Breton Company, which is building a railroad from the mines to the magnificent port of Louisburg, piers and other shipping facilities, proposes to put up at that port iron and copper furnaces. The copper ore from Tilt Cove, Newfoundland, which is now shipped to Swansea, would then be treated at Louisburg, and the mat, or regulus, would be exported. There is an abundance of iron ore of good quality in Cape Breton, so that there is a prospect of the manufacture of iron forming an important item in the mineral statistics of the Province in future reports.

Errata.

IN the Analysis of Plans for Rapid Transit, published in the last number of this paper, the following corrections should be made:—

Design No. 28 was presented by J. B. TIBBITTS; 30 and 31, by J. X. L., and 33, by J. J. WILLIAMS. There are a few other errors of little importance which will doubtless be corrected by the reader.

CORRESPONDENCE.

Blast Furnace Practice.

APRIL, 5, 1875.

TO THE EDITOR.—SIR: In looking over example of blast furnace working, published in ENGINEERING AND MINING JOURNAL of March 27th, two extraordinary things would be noticed: the small quantity of fuel used and the small quantity of iron made. The question might naturally be asked; "Is there any connection between them, is one of these partly or wholly the cause of the other?" The cubic contents of the stack are not given, but from its size, 45×11, cannot be much under 2,500 feet, and the product would be 1 ton in 24 hours for about 250 cubic feet. Furnaces make this amount of iron in the time given for from 100 to 300 cubic feet internal capacity, and it seems so often the case that those using the most fuel make the most iron from the same cubic contents, that it may be accepted as a rule that, other things being equal, the consumption of fuel is inversely in proportion to the number of cubic feet for a ton of iron made in a given time. If this is true, the cause must be this: The $C O^2$ from C of fuel is all produced above the tuyeres by the C O taking up O on its passage from the tuyeres to the top; the longer this C O is in contact with the ore the more $C O^2$ will be formed and the more heat obtained from the same quantity of fuel. This prolongation of the contact is accomplished by enlarging the size of the stack or slow driving of the furnace. In proof of the truthfulness of this position we have the known facts as follows: 1st. Furnaces of 12,000 cubic feet use about the same amount of fuel as those of 5,000, if the product is increased so that the cubic feet for ton of iron in given time is nearly equal. 2d. This West Virginia furnace of small size uses much less fuel than those of four times the cubic contents, but requires twice as many feet for a ton of iron in a given time. 3d. Furnaces of 4,000 to 6,000 cubic feet, as usually driven, get hot whenever the blast is slackened, it being a very common practice of furnacemen to lessen the blast whenever it is necessary to increase the heat. 4th. Analysis has proven that weakening the blast does usually increase the proportion of $C O^2$ in gas. 5th. Increasing the size of furnaces producing a decrease in amount of fuel used, is always accompanied by an increase in cubic feet for ton of iron in a given time.

In contradiction of these facts, evidence seems scattering and apparent cases may be explained by other causes. The quantity of $C O^2$ produced is influenced by kind of material used, temperature of blast, distribution of stock in furnace and of gases passing through the stock, that is in channels or generally diffused. The fact, that in some furnaces slackening the blast is followed by decrease in quantity of $C O^2$ may be accounted for by reason of the decreased pressure not causing the blast to penetrate the stock, the gas, in a measure, passing up the sides of the stock and not coming in contact with the ores as thoroughly as usual. The fact that the blast not penetrating the stock will decrease the $C O^2$ seems proven by determinations of C O and $C O^2$ in gases where increased resistance was offered at the tuyeres, first, by allowing cinder to raise above the tuyeres, second, when the stock had become packed by slipping. These determinations have not been made in enough cases to absolutely prove the matter, but several instances are known to the writer, where the quantity of $C O^2$ has decreased under these circumstances, though as the proportion of $C O^2$ and C O is constantly varying, it may have been a coincidence and not the effect of causes supposed.

If the proportions taken are correct, it seems fair to conclude:

1st. For economy of fuel, the product of blast furnace should not be over 1 ton per 24 hours for 250 cubic feet internal capacity.

2d. Comparatively narrow hearths, allowing the blast to better penetrate the stock, will cause a saving of fuel.

3d. Proportionally wide tops and large beds will cause a good distribution of stock in furnace and economy in fuel.

If other matters of economy require large products of iron, say of 100 tons a day, it would seem desirable to build stacks of 30,000 cubic feet.

FURNACEMAN.

The Construction and Operation of a Slag-hearth.

By J. Y. BERGEN, Jr.

THE utilization of lead-slags produced in smelting the purer galenas is a problem of peculiar interest to the American metallurgist, as he is often called upon to deal with slags from Scotch-American hearths and reverberatory furnaces smelting for the production of a corroding lead direct from the ore.

The purity of the galenas obtained in the Illinois and Wisconsin mines, more notable yet in those from the "Soft-Missouri" lead region, leaving cupola smelting entirely out of the question, accumulates large quantities of slag valuable only for the production of a hard or "scoriae" lead.

For the treatment of these slags, furnaces of cupola form are generally inadmissible, as being too expensive to build and unsuited to the smelting of slags containing, as is often the case, fragments of firebrick and other rubbish in such quantity as to quickly foul the furnace and prevent long campaigns. The old English slag-hearth, however, is so slow in its operation and entails so much expense to the amount of lead produced, as to have become almost obsolete where rapidity of production is an important consideration. But the low first cost and convenient operation of this form of furnace have been happily combined with increased production in the construction adopted by the best smelters in the Wisconsin mines, and lately introduced into the lead mines of Missouri; a construction which is, I think, the best in use for smelting works of moderate size.

The slags, with which the furnace has to deal, whether from Scotch hearth or "air-furnace," are closely similar in character; the former occur in coarse lumps composed of varying admixtures of sulphide, sulphate, oxide and silicate of lead, agglomerated with more or less completely scorified particles of gangue, and containing numerous shots of metallic lead; air furnace slag is rather more finely divided, contains fewer lead shots but a higher percentage of lead, ranging from 33 to 46 per cent. metallic, while Scotch-hearth slags yield 30 to 37 per cent. Hearth-ends, or "bottoms," from the air-furnace, are somewhat more infusible than ordinary slags, and contain 26 to 30 per cent. of lead in metallic shots and strings and in the form of red-lead; also scorified with silica. (See tables of assays and analyses.)

The charge for the furnace will be composed of the hearth-ends and slags above mentioned, and a few others, with fuel (coke); the use of fluxes being, in general, unnecessary.

The furnace.—The dimensions are:

	inches.		inches.
Width of hearth	26	Slope of bed-plate to 1 foot	1½
Depth, front to back	36	Size of bed-plate	40×48
Height	46	Size of front-plate	30×36
Diameter of tuyere	3	Long diam. of lead-pot	36
Height of do. above bed plate	10	Front to back of lead-pot	12
Height of port	9	Depth of lead-pot	12
Width of do	12	Thickness of lining, back and sides	9
Prolonged axis of tuyere strikes front lining of furnace above port	2	do. do. do. front	5

The cast-iron bed-plate, which forms the sole or hearth proper, rests by its whole under-surface on tightly rammed clay, or stone laid in clay, except in front, where it over-laps the brim of the cast-iron lead-pot. The fire-brick lining rests directly on the bed-plate and should be laid of brick of the ordinary form with all the side and back courses headers.

On the bed-plate, over the whole bottom of the furnace, is tamped a brasque or a moistened mixture of equal parts, by bulk, of clay and coke rubbish, to the thickness, at the back of the hearth, of five inches, thinning at the port to one inch. This brasque is not disturbed or renewed excepting when it becomes necessary to reline the furnace. The lining is repaired by patching with fire-clay and bats of fire-brick, from time to time (as will be hereafter mentioned), the original rectangular form and vertical sides of the furnace being as nearly as possible preserved. I have found the smelting of the furnace less satisfactory where the form of the horizontal section approximated to the oval than where the corners were, as usual, left unfilled. A stack, in the form of a hood of suitable size, serves to convey the fume away from the furnace-top—preferably into a condensing flue, but ordinarily into the open air. To protect the workmen from escaping fumes the hood should be as low as it can conveniently be allowed in front; and to give facilities for the use of bars at either side, in front, it should be supported by a very flat arch or a cross-beam of proper dimensions.

Preparation for smelting is begun by ramming the port full of stiff clay through which, at the bottom, a wooden tap-plug is introduced and driven well up into the center of the hearth. Sticks of dry kindling-wood are then stood in in inverted V shape, thus, Λ, from front to back of the furnace, so as to form a temporary tunnel for the passage of the blast from tuyere to port. A shovel-ful of live coals is then thrown in at the back over the mouth of the tuyere and the furnace filled to the top with clean charcoal; half-blast is then put on till the charcoal appears thoroughly ignited and burns over the top with a blue flame. Coke should in the meantime be spread to the depth of six inches over the charcoal, a little more thickly behind, and the full smelting-blast admitted.

Charging slag evenly over the top of the furnace, and especially behind, may at once be begun, and in the beginning, for forming a nose, the cleanest obtainable slag of moderate fineness should be employed. Coarse brouss charged at the outset, as described by PERCY, in his account of smelting on the English hearth, has not, so far as my observation goes, produced so good a nose, nor formed it so quickly, as good slag will do. Brouss from the slag-hearth is mostly in rather larger lumps, and these lumps charged at the outset will not infrequently settle in front of the nozzle and choke the blast.

The normal charge of about four shovels of slag to one of coke may be given from this time, care being taken to dispose the fuel for the most part in the front and along the center, the slag around the back and sides of the top, and to keep the furnace even full. Blow-holes should not be allowed to form, but the blast kept even over the top, only strongest in front. At the outset the top may be left rather bright, but when a full smelting heat has been established, the top should be kept dull by sufficient charging to prevent undue volatilization and unnecessary consumption of fuel. When the material charged has first to be sluiced or jigged, it will be found advantageous to charge it wet.

The tap-plug may be drawn half or three-quarters of an hour after the admission of the full blast; and, if necessary, a steel bar should be driven through the opening left, well up into the furnace, and quickly withdrawn. The lead-pot should, in the meantime, have been rammed full of finely-broken charcoal, over which the stream of melted "black-slag" will pass into the water-tank through which flows a slow current of water.

The lead reduced settles at once through the charcoal filter, and passes through an opening in the partition into the moulding end of the lead-pot. The stream of black-slag should be kept running freely by bridging over with a billet of wood or charcoal brand, and by "snouting" with a chisel-pointed steel bar, when it passes over the front of the pot. The operation of the furnace may be judged by the appearance of the stream at this point. The slag should run in a thin stream of a bright straw-yellow color—fuming of the slag indicates the passage of lead-matte, to be remedied by the addition of desulplurizing fluxes, or the charging of more highly oxidized slags.

A sluggish, dull, red flow of slag causes mechanical loss of lead in shots carried over, and indicates too low a heat, caused in most instances by insufficient blast. This difficulty can often be remedied by breaking off the point of the nose with a long bar introduced into the furnace through the tuyere from behind. The pressure of blast should be as great as can be employed without blowing particles of coke and slag out of the furnace top. Nine ounces to the square inch will smelt more rapidly, and with less fuel, than a less pressure, but more than this amount would not generally be advantageous.

When a slag continues to run sluggishly, and the operation with proper charging proceeds too slowly, the trouble is usually to be found in the shape of dirt, ashes and other rubbish in the slag. It will then be found necessary to sluice at least the finer portions of it, but indiscriminate sluicing of slag is to be avoided, since air furnace slags, as usually sold, contain a large amount of lead-material, as fine powder in the fume, or "arsenic," from the stacks, with a value of 36 to 38 per cent. lead. Slime-tanks should be connected with the sluice discharge, and the material collected in them concentrated on suitable jigs; slime collected from washing ordinary air-furnace slags will give from 4 or 5 up to 18 per cent. lead. Scotch hearth slags never require sluicing, and where these or other clean slags constitute the bulk of the charge, dirtier slags, "chats," clayey carbonate ores of lead, and other impure lead-containing ores and furnace-products may be worked to advantage on the slag-hearth. It will not in general be found possible to maintain an invariable composition for the black-slag; the diminished rate of production, cost of fluxes and additional fuel required, will more than counterbalance the slight saving in percentage of lead and protection of the furnace-lining from attack of basic slag.

It will, however, be found advisable to mix siliceous and aluminous bottoms with lime-containing slags, and to maintain as nearly as possible a constant percentage of lead in the charge. This percentage will vary in practice between the limits of 35 and 40 per cent., yielding in furnace 20 to 25 per cent., or a 75 lb. pig of lead to each 300 to 375 lb. of slag charged. Of the 15 per cent. loss, 3 to 6 per cent. are due to scorified lead, carried off in black-slag, the remainder to volatilization and mechanical loss. Hearth ends and brouss from the slag-furnace should be recharged during the campaign, and in small quantities at a time, the lumps of brouss will be found serviceable, charged in the back corners to keep them open.

The rate of production of the furnace will increase, so that while the first eight hours running will produce 40 pigs of 75 lb. each, the next eight hours, with same slag, will produce 60 pigs. Lean slag, low blast or poor fuel, will decrease the production.

Care should be taken, after the furnace has reached its maximum speed, to keep the lead-pot full of clean charcoal, otherwise much dross will be produced. It will be found advantageous to clean out the pot entirely, and refill with fresh charcoal once in two or three hours, and clean lead can then be molded throughout the campaign. The duration of the campaign may be prolonged to some days, but by the end of the sixteen hours already described, the bottom of the furnace will usually have become more or less fouled with pieces of brick and other rubbish, and the lining in places eaten into holes; for these reasons it is not usually found advisable to prolong the campaign beyond this point, and the smelter will begin the operation of burning down without further charging, which is continued till black-slag ceases to run, when the port is opened, and the loose contents of the furnace drawn out through the opening, after first cleaning out and refilling it with charcoal rubbish.

Three or four pail-ful of water are then thrown in at the top and the furnace allowed to cool till morning, when it is stubbed out with the sledge and steel bars, the holes in the lining patched, and the port filled, when firing is begun as before.

The work of the furnace and smelting expense may be summarized thus:

30,000 to 37,000 lb. slag, of assay value 35 to 40 per cent., can be smelted in sixteen hours, producing 7,500 lb. hard lead, at a cost of—

Wages of 2 chargers at $3	$6 00
" four helpers, at $1 75	7 00
" one yard hand, at $1.50	1 50
100 bushels coke, at 25c. per bushel	25 00
22 " charcoal, at 12½c. per bushel	2 75
Expense for 10 horse power	8 00
Oil, tools and sharpening	0 30
Total	$50 55
Smelting expenses to 1,000 lb. lead	$6 73

Lead, lead-dross (85 per cent. metallic) and black slag, besides the brouss obtained in stubbing out, are the furnace products obtained. The lead cannot, at present difference of price from corroding lead (⅝c. to ¼c.) be profitably refined, and is sold as hard lead. Unsalable, drossy pigs and dross are not to be thrown back in the furnace top, but should be reserved for a separate reduction, which is to be performed with charcoal by aid of a light blast. 600 to 800 lb. of lead per hour can thus be reduced from dross, with charcoal-rubbish useless for other purposes, with very little loss of lead. Loss of lead in the black slag cannot be entirely prevented, but care should be taken to prevent lead from being mechanically carried over, and black slag containing many shots should be recharged at once, or after concentration by jigging. Condensing apparatus attached to the

stacks would (where the extent of the operation would warrant) quickly pay for the cost of erection.

The percentage composition of the various slags charged in, and obtained as products of, the slag-furnace, I am not able to give in full; not having had recent access to facilities for complete analyses.

Four analyses of galenas and three of lead-slags are appended, with the addition of some results of many crucible assays performed with soda, argols, borax, and metallic iron, as recommended by Mitchell:

Galena and Slag Analyses, from Report of State Geol. Survey of Missouri, '73-'74.

	A	B	C	D	1	2	3
Silicious	0.61	0.71	0.15	0.21	23.98	14.15	12.32
Lead (met.)	84.06	....	....	....	38.09	55.45	53.58
Iron "	0.16	1.95	0.24	0.48	3.09	2.08	1.80
Zinc "	0.94	0.73	trace	trace	8.13	5.43	9.23
Lime	0.42	0.86	....	....	15.72	11.25	10.37
Silver	½oz. to ton	¾ oz. to ton	none	trace	....	....	....

A.—Galena as delivered to furnace, Holman diggs, Granby.
B. " " " Swindle " Joplin.
C.—Galena, Walker diggs., Miller Co., Mo.
D. " New Granby diggs., Morgan Co., Mo.
1.—Scotch-Am. hearth slag "Riggins & Chapman," Joplin.
2, 3.—Air-furnace slag, "Jasper L. & M. Co." Joplin.

Galenas *A.* and *B.*, from the South-western mines, occurring in chert and cherty limestone of Lower Carboniferous age, show a comparatively high silicious contents, while *C.* and *D.*, which are typical galenas of the Central Missouri lead region, show a much lower percentage of silica, being mined from magnesian limestones of Lower Silurian or Calciferous age, and occurring commonly with barytiferous gangue. Zinc is rare, and when present, mostly in small quantities in the central region, hence its galenas are free from this metal, and it is not generally to be found in the slags of the region.

Iron as pyrites, or ferruginous "joint-clay," is a nearly universal accompaniment of galena.

Of the slags, No. 1 may be observed to differ from 2 and 3 in being poorer in lead, with a consequent higher percentage of foreign matter, lime being an especially abundant constituent, as a result of the practice of dusting over the charge for the Scotch-American hearth with slacked lime, to "set up" the slag, and, perhaps, as a desulphurizer. All three of the slags given were produced from the smelting of a galena substantially like *B*, and consist, essentially, of the impurities of that galena concentrated by themselves, and more or less scorified with lead. No considerable amount of unaltered galena will be found in well smelted slag, and few metallic shots in air-furnace slag. Iron will be observed to have been much less concentrated in the slag than the other impurities, an appearance of things which may be partly explained by the fact that the galena *B* is somewhat more pyritiferous than other Joplin galenas; but part of the explanation must lie in the absorption of more or less iron alloyed with the lead produced in the first smelting. It may be remarked, in passing, that 2 and 3 are too rich for average air-furnace slags by about 8 per cent. of lead.

Clean galena at Joplin, smelted in air-furnaces, yields to 1,500 lb. charge galena about 85 lb. slag, or 5⅔ per cent., but much earthy or silicious matter in the charge may leave as much as 10 per cent. slag.

Crucible Assays of various slags and furnace products, conducted by the method of Mitchell above-mentioned (and mostly in duplicate or triplicate), have given me results from which the following are selected:

	Metallic Lead.
Fume from air-furnace stack, Joplin	0.385
" " " Morgan Co.	0.372
Average of several tons air-furnace slag, Morgan Co.	0.44
Same from smelting of coarser or "chunck" mineral	0.412
Average of 125,000 lb. Scotch-Am. hearth slag, Joplin	0.35
Tailings from machine jigging of above	0.20
Scotch hearth slag, Morgan Co.	0.37
Skimming from hand-jigging of same	0.306
Same air-furnace slag, Cole Co., Mo.	0.463
Same from another furnace	0.45
Slime from sluicing air-furnace slag	0.18
Lean bronss from slag-hearth	0.127
Black slag, free from met. shots	0.027
Same with few shots, average of 200,900 lb	0.037
Air-furnace bottoms, Morgan Co.	0.262
Dross from lead-pot of slag-furnace	0.852

Besides the ingredients already given in the complete analyses, other elements occur in notable quantity, and I have found the black slag obtained from smelting a mixture of slags from nearly all the furnaces of the Central Missouri Region, to yield decisive reactions for silica, lead, iron, lime, magnesia, baryta, alumina, manganese and sulphur.

The utilization of this black slag, except for mechanical purposes, such as road-making, is not often possible; in some cases, small quantities may be used as a diluting flux, a purpose for which it is fitted by its ready fusibility, as well as by being already saturated with lead.

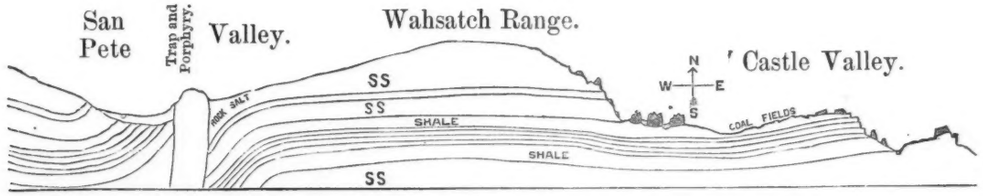
The question of fuel has not, so far, been discussed in this paper. The use of coke being assumed, except where charcoal is used as a kindling material at the outset. Charcoal may, however, be exclusively employed in cases where coke is not readily obtainable; for this purpose, the furnace should be at least a foot higher, to produce the proper heat, and prevent mechanical loss at the top. In any event, the use of charcoal will, while producing a rather better quality of lead, cause greater expense for fuel, of which a larger percentage to slag than that (10-12½) of coke, by weight, must be employed. Working the furnace will also become more difficult, and the lessened heat and more difficult fluxing of black slag will cause diminished production.

The Castle Valley and San Pete Coalfields, Utah.

[From the Report of the U. S. Commissioner of Mining Statistics for 1874.]

THE Castle Valley and San Pete coalfields have attracted considerable attention during the past year, and are, no doubt, of the utmost importance to the lead and silver industries of the Territory; but besides this they are of very great value in connection with the future iron industry of Utah, of the development of which there can be no doubt, in view of the immense iron deposits in a large part of the southern half of the country. In these fields occur coals, which permit of coking. Considering that, besides the beds of Trinidad in Colorado, and one at Mullen's Pass, Montana, these veins are the only ones known in the far West, where large quantities of good coke can be made, their importance for industrial pursuits is at once apparent.

Mr. J. E. CLAYTON, of Salt Lake City, has kindly furnished me with notes of a late visit to the Castle Valley field, and also with the accompanying ideal section.



The "Castle Valley" coalfield is situated at the eastern base of the Wahsatch range, and 55 miles, by the Gunnison trail, east of "Salina," on the Sevier River. The pass through the mountains by the way of Salt Creek and one of its southern branches, is one of the best for a wagon- or rail-road in any portion of the Wahsatch range.

The formation is sandstone, with two very thick beds of shale or indurated mud. There is but little trace of stratification in these shale beds, but they are cracked into all sorts of irregular shapes. There are occasionally calcareous nodules imbedded in them, but very few fossils have been found. Mr. CLAYTON found a few *Ostreae* at the bottom of the upper shale bed, next to the zone of sandstone that contains the principal coal measures, and also found a pavement scale of a shark or *ganoid*, as well as a petrified trunk of a palm tree, one foot in diameter, and 8 to 10 feet long, the latter imbedded in the sandstone below the upper shale zone. Both the sandstone and shale contain very little lime. The formation is divided into three zones of sandstone, and two of shale, as shown in the section. The lower sandstone was not examined.

The lower shale bed is at least 600 feet thick, and is darker than the upper one, its color along the exposures being dark bluish gray. The upper shale bed is lighter colored on the surface, and dark gray below. The middle sandstone, lying between these two shale beds, is about 800 feet thick, and in this are the great coal seams of Castle Valley. There are from 3 to 5 seams, the two lowest being the most important on account of their size, uniformity, and superior quality.

No. 1, the lower bed of coal, is very hard and compact, but little disposed to slack, and in some places along the face of the bluff, where the sandstone stands in perpendicular cliffs, the coal seam shows faces almost flush with the overlying cliffs. The floor of the seam is a hard grayish-white sandstone, made up of clay and sand, for from 2 to 6 feet below the coal, at which point the clay disappears, and the underlying sandstone is yellowish gray, part of it being quite hard and semi-vitreous. The roof is composed of the ordinary gray sandstone of the middle zone. The thickness of seam No. 1 varies from 3 to 8 feet, and will average probably 5 feet of good coal; there is a small seam of black shale near the roof from 1 to 4 inches in thickness. There is no other waste in the bed; a firm sandstone roof rests immediately on the coal. This coal burns freely with very little smoke, leaves 3½ per cent. of white ash, and is remarkably free from sulphur or iron. For the generation of steam, and for domestic use, it has no superior in this country.

No. 2 lies about 40 feet above the one just described, and contains 6 to 20 feet

of clean, solid coal, without a seam of shale in it; but there is quite a bed of shale overlying the coal. This overlying shale contains a number of small seams of coal, from 4 inches to 4 feet thick, and is from 20 to 40 feet thick at the point where a cut was made into it. At one point measured, this No. 2 coal-bed was found 21 feet 6 inches thick, and without a trace of shale in it. The floor is like that of No. 1 bed, a white argillaceous sandstone. The quality of the coal is not as good as that of the lower bed; it is softer, more inclined to slack, and has more ash (6 to 10 per cent.), but is also free from sulphur or iron.

Nos. 3 and 4 lie in the upper beds of the middle zone of sandstone. They are not so regular or uniform in size as those described before, but the coal is of the same general quality. These beds vary from 1 to 4 feet in thickness, judging by the exposures examined, except at one or two places where the outcrop is 6 to 8 feet thick.

The principal reason that the upper beds could not be examined as well as the two lower ones, is that they have been burned out over areas of several thousand acres, and several places were found, where they were still burning. The burnt districts could be plainly traced by the color of the sandstone, which is brick-red in these localities.

These overlying coal seams must have been very thick in places, judging from the effects of the fire on the sandstone. There are places, where the latter is not only burnt red, but is actually glazed and vitrified by the heat. Masses of glazed fragments, adhering together in large boulders, can be seen in the side ravines of the main cañons.

The position of these beds is horizontal on a line N. E. and S. W., but in the opposite direction, N. W. and S. E., they lie in gentle waves, making very flat anticlinal and synclinal axes, as shown in the section.

The available area of the coalfields is about sixty square miles. The extent, so far as at present known is 12 miles long N. E. to S. W., by 4 to 8 miles wide from N. W. to S. E.

Nos. 5 and 6 are two well marked coal seams, about 1,200 to 1,500 feet above the middle zone. These beds lie nearly horizontal, showing a slight rise towards the West, but after passing the center of the mountain, the beds all dip in a curved line towards the Sevier River and the San Pete Valley, which is a long narrow valley enclosed between two branches of the Wahsatch range. Along the Eastern side of this valley there is a great fault or break in the formation, and extensive outflows of porphyry, trap, and occasionally true lava, have taken place. The position of the sedimentary beds East of the break is well exposed in Salina Cañon, but their positions West of the eruptive rocks can only be inferred by the exposures of the beds West of the valley. The San Pete coal measures are, in Mr. CLAYTON'S opinion, the same as those shown in the mountain section as Nos. 5 and 6. In the prolongation of the Castle Valley section to the West, across Sevier River Valley, the position of large salt deposits, just East of the eruptive rocks, will be remarked; it is readily seen, why this salt was so deposited. The dip of the beds West of the summit of the east range, underlaid by shale, brought the drainage down against the hot eruptive rocks; the water was vaporized and escaped upwards through the crushed and broken shale and the salt crystallized in the interstices of the broken mass. Large deposits of gypsum also occur along the line of fracture near the salt.

To render the Castle Valley coalfields available, a railroad about 85 miles long will be required to connect with the Utah Southern Road at Sevier River Bridge. If the C. P. R. R. Company should build a branch starting from Wells station, or from Tecoma, they would have no obstacles until they reached Salina Cañon, a series of low gaps through the Nevada ranges, making the road virtually a valley line from Tecoma to Gunnison's, or Salina Pass, in the East Wahsatch range. From Castle Valley to Denver, to connect with the Kansas Pacific, is the only difficult portion. This line would, however, be 200 miles shorter than the present Pacific lines.

In regard to the San Pete coalfield, I am indebted to Mr. GEO. P. LOCKWOOD, M. E., of Salt Lake City, for the following further information:

The San Pete coal field is located in San Pete Valley, 90 miles south, and 10 miles east, of Salt Lake City. As far as known, it comprises 4,080 acres on the west side of the valley. The sandstone in which the coal is found is estimated to be here 1,500 to 2,000 feet thick. In these rocks five distinct coal veins have been found, which vary in thickness from 8 inches to 4 feet. The two principal veins are respectively 4 feet and 26 inches thick, and are separated by 8 inches of limestone. The strike of the veins is about due N. and S. and they dip at a slight angle to the West. The coal measures are cut by four cañons at right angles to the strike of the veins. Most of the developments are at those points where the veins are exposed on the sides of the cañons.

On the North, in New Cañon, the vein has been opened by 3 working levels—50, 100, and 400 feet long respectively. In Old Cañon, one mile south, there are three levels opened of 50, 200, and 800 feet. In Big Cañon, about two miles further south, there are three openings of a limited depth. The four foot vein has increased at this point to five feet. In Axe-handle Cañon, about three miles further south, the vein has been opened and found to be six feet thick, the interstratum of limestone having here disappeared. This shows an increasing strength in the vein in going from N. to S. From 2 to 3 miles north of New Cañon, the vein is found near the top of the mountains, while below Axe-handle Cañon it appears in the foot-hills. The 800 foot level at Old Cañon runs north, about parallel with the strike of the vein.

At the heading of this level coal was mined for 20 feet on either side. The roof in this chamber, and in the level is so firm as to need but little support, showing that a minimum amount of coal need be left in the workings as pillars, and wide chambers can be laid out. The coal separates clean from the walls, and the floor is firm and regular. In regard to the estimated amount of coal in these fields, I gather the following from the report of Mr. ISAAC STONE, M.E., F.G.S., of North Wales." The length from North to South is about 8½ miles, and the width, from 5 to 6 miles; the outcroppings of the coal, at right angles to its strike, looking from the East, may be distinctly traced. From what I saw of the strata underlying the most southern portion of the property, I have no doubt that the same coal will be found there also, making a *total* length of 8½ miles. . . . . The strata, too, parallel with the dip line to the West, can be clearly and distinctly seen, and a definite conclusion may be arrived at as to their continuity westward." Altogether, Mr. STONE estimates the area of the coal fields to be at least 7,760 acres, with an average thickness of fine working coal over the whole area of 3' 6". Future developments may increase the area, as well as strength of vein. It is generally believed that by sinking new veins will be found which would greatly increase the resources of the fields.

The coal is pronounced by H. S. POOLE, F.R.S., of London, Prof. F. A. GENTH, of the University of Pennsylvania, and Mr. STONE, to be bituminous. It is hard, dense, and of uniform structure. Color, black; streak, black; lustre, medium to bright. Specific gravity, undetermined, but low. Cleavage, uniformly parallel to the faces of the cube. Chemical examinations by H. S. POOLE, F.R.S., have shown:

TOP COAL.	MIDDLE COAL.
Volatile matter, 35.50 (includes H. O.)	Vol. matter.... 32.00 (includes H. O.)
Coke..... 64.50 (" Ash.)	Fixed Carbon.. 56.80
BOTTOM COAL.	Ash..... 11.20
Volatile matter, 33.70 (includes H. O.)	Average perc'tage of coke 66.13 per cent.
Fixed Carbon.. 54 29	
Ash..... 12.01	

By. Prof. F. A. GENTH.

Moisture..... 1.16 per cent.	Ash.....11.18 per cent.
Volatile matter.....32.91 "	Coal contains 2.88 per cent. of Sulphur.
Fixed Carbon.....54.75 "	

By FRED. CLAUDET, of London.

Ash.....10.54 per cent.	Sulphur..... 1.80 per cent.
Coke.....62.10 "	

Dr. JOHN PERCY, London.

Coke..... .62.00 per cent.	Ash.. .....10 00 per cent.
Volatile matter.....28.00 "	

Dr. GENTH says that "the coking qualities of this coal are not inferior to those of the best Pittsburgh coal, and that the coke made of the same is apparently of excellent quality, and sufficiently dense to bear the burthen of a blast furnace." Some of the coke, manufactured in a crude way, was used in the blast furnaces of the Germania Works, six miles South of Salt Lake City. When mixed with one-half of St. Louis coke it worked well. Alone, it matted, forming a cake through which the blast could not penetrate. This indicates plainly, that the coal had not been exposed to a sufficient heat, and there is no doubt, that upon a better coking, it would be found suitable, at least, for the use of the lead blast furnaces, when the charge column is not more than 12 to 20 feet high. Its principal demerit now seems to be lack of tenacity. As a steam generator it is claimed that two tons of San Pete coal equal three tons of Wyoming lignite.

The sandstones occurring in the coal measures are of a light gray color. During 1875 it is intended to connect these fields by a narrow gauge road with the Utah Southern R. R., at Nephi, and thus to bring the coal into the market.

Cost of Boring by the Diamond Drill in Nova Scotia.

FROM Mine Inspector H. S. POOLE'S Report on the Nova Scotia Mines, we learn that a Mr. LIVESEY has imported and set up an *English made diamond drill* that works very satisfactorily. The following information is given by Mr. L:

Borehole No. 2, in the Spring Hill District, Cumberland County, was 715 feet deep; 5½ inches in diameter at the top, and 3⅜ inches at the bottom. Time occupied in boring, 48 days; cost, about $1,160, including repairs and renewal of diamonds, but exclusive of interest, depreciation and royalty. The greatest depth bored in any one day was 36 feet. The average number of persons employed was five. The cost of the machine, with 1000 feet of rods, was about $8,500 in England, or, say, $10,000 erected in Nova Scotia. The borehole, after passing through slate and sandstones, ended in conglomerate.

Work of the American Diamond Drill.—Boring made by Mr. LOGAN, at Hardwood Hill, Pictou County. Depth of hole, 534 feet; time occupied, 24 days; measures pierced were fireclay and sandstone beds. Best day's work, when using hollow bit and taking up cores, 27 feet, and with solid bit 31 feet. The machine cost $5,000. It is operated by one man and a boy; owing to cold weather have had an extra hand to keep pipes from freezing at night.

Expenses, moving machine and erecting shed.....	$111 50
Wages.....	138 00
Fuel.....	90 00
Interest, renewals, etc., at 50 cents.....	267 00
Total cost of boring 534 feet.....	$606 50

Or $1.14 per foot, average. Doubtless the same work could be done cheaper during warm weather.

STATISTICS OF COAL PRODUCTION.

Anthracite.

Anthracite free. *Bituminous*, per ton of 28 bushels, 80 lb. to the bushel, 75c., gold.

All *slack*, or *culm*, such as will pass through a half-inch screen, per ton of 28 bushels, 80 lb. per bushel, 40c., gold.

Not otherwise provided for, per ton, 40c. gold.

This is the only report published that gives full and accurate returns of the production of our Anthracite mines.

Comparative Statement for the week ending April 10:

	1875.		1874.	
	Week.	Year.*	Week.	Year.
Wyoming Region.				
D. and H. Canal Co	52,044	699,029	53,448	605,480
D. L. and W. RR. Co	71,532	692,487	47,064	607,576
Penn. Coal Co.	28,143	288,093	25,532	286,982
L. V. RR. Co.	13,103	251,963	29,135	266,296
P. and N. Y. RR. Co.	2,972	10,329	2,675	15,802
C. RR. of N. J.	4,009	57,196	31,142	283,106
Penn. Canal.	..	..	..	..
Lack. and B. RR.	5,102	41,426	7,011	50 018
	176,905	2,040,523	196,007	2,115,260
Lehigh Region.				
L. V. RR. Co.	4,973	110,205	76,369	746,093
C. RR. of N. J.	..	5,499	36,438	195,776
D. H. and W. B. RR.	1,181	7,313	513	4,137
	6,154	123,017	113,320	946,006
Schuylkill Region				
P. and R. R. RR. Co.	19,508	249 794	125,056	968,814
Shamokin and Lykens Val.	21,554	206,657	12,061	132,499
	41,062	456,451	137,117	1,101,313
Sullivan Region.				
Sul. and Erie RR. Co	502	4,039	319	6,161
Total	224,623	2,624,030	446,763	4,168,740
Increase	..	..	..	..
Decrease	222,140	1 544,710	..	..

* Year beginning January 1st.

The above table does not include the amount of coal consumed and sold at the mines, which is about five per cent. of the whole production.

The following table does not give the entire production of our bituminous mines, but it is by far the fullest report published.

The Production of Coke for the week ending March 28.

Tons of 2000 lb.

	Week. Tons.	Year. Tons.
Tyrone and Clearfield	..	261
Alleghany Region	..	53
West Penn. R.R.	893	13,533
Southwest Penn. R.R.	6,223	118,253
Gas Coal, Penn. R.R.	110	7,826
Pittsburgh Coal, Penn. R.R.	636	20,328

Production of Bituminous Coal, 1875.

Tons of 2000 lb.	Previous.	Feb.	Total.
Blossburgh Region	19,039	24,763	43,802
Barclay Region	28,605	26,702	55,307
McIntyre Coal Co.	5,911	3,950	9,861
Broad-Top Region	11,607	12,204	23,211
Cumberland Region	87,579	77,184	164,763
East Broad Top	1,790	2,091	3,881
Snow Shoe	6,277	5 624	11,901
Clearfield Region	47,453	59,323	106,776
Alleghany Region	14,887	14,858	29 747
Pittsburgh Region.			
West Penn. RR.	16,055	13,758	29,813
Southwest Penn. RR.	413	524	937
Gas Coal, Penn. RR.	61,893	64,367	126:260
Pittsburgh Coal, Penn. RR.	22,172	16,503	38,675
Saw Mill Run RR.	287	..	..
Cleveland and Pittsburgh RR.	20,882	25,900	46,782
Pittsburgh, Cincinnati and St. Louis RR.	50,598	64,820	115,418
Erie and Pittsburgh RR.	11,998	15,872	17,870
Pittsburgh, Fort Wayne and Chicago RR.	13,718	16,524	30,242
Castle Shannon RR.	7,998	8,734	16,732
A. V. & P. R.R.	242	233	475
Pittsburgh and Connellsville RR	25,850	24,404	50,254
Monongahela Nav. Co.	..	..	..
Keeling & Co.	8,741	8,750	17,491
Weltenal & Gormley	1,961	..	..
J. W. Carlin & Co.	..	..	..
Pittsburgh Va. & C. R.R.	2,346	4,098	6,444
Allegheny Valley R.R.	48,249	44,432	92,681
St. Louis Region.			
St. L. A. & T. H. R. R. and Branches	31,060	30,883	61,943
Illinois and St. Louis	..	..	..
Indiana North and South RR.	264	..	..
Evansville & Crawfordsville RR	2,365	2,886	5,151
Ohio & Mississippi RR.	20,042	19,654	39,696
Sewanee Region.			
Tenn. Coal & R.R. Co.	8,745	9,494	18,239
Kanawha Region.			
Chesapeake and Ohio RR.	7,947	6,035	13,982
Warrior Region, Ala.			
South and North Alabama RR.	3,424	3,504	6,928
Cahaba Region, Ala.			
South and North Alabama RR.	1,390	1,400	2,790
S. R. & D. R.R.	1,257	1,067	2,324
Chicago B. & Q. R.R	37,634	39,661	77,295
B. & M. R.; R.R.	7,371	7,503	14,874
Union Pacific R. R.	12,572	23,025	35,597
Summit County R.R.	..	..	..
Keokuk & Des Moines R. R.	..	..	..
Denver & Rio Grande	3,104	2,939	6,043
Cairo & St. Louis	3,106	..	..

The Production of Bituminous Coal for the week ending April 10, was as follows:

Tons of 2000 lb., except where otherwise designated.

	Week. Tons.	Year. Tons.
Cumberland Region, Md.		
Tons of 2240 lb.	43,147	338,878
Barclay Region, Pa.		
Barclay R.R. tons of 2240 lb.	3,628	81,574
Broad Top Region, Pa.		
Huntingdon & Broad Top R.R.	3,021	51,855
East Broad Top	478	7,198
Clearfield, Region, Pa		
Snow Shoe	950	19,384
Tyrone and Clearfield	10,181	198,013
Alleghany Region, Pa.		
Pennsylvania R.R.	2 423	44,108
Pittsburgh Region, Pa.		
West Penn. R.R.	2,793	46,255
Southwest Penn. R.R.	36	1,484
Penn and Westmoreland gas coal, Pa. RR.	2 540	148,198
Pennsylvania R.R.	2,852	64,593
Kanawha Region, W. Va.		
Chesapeake and Ohio R.R.	4,960	31,317

Receipts at Port Richmond, none; shipments, 1,600 tons; and balance on hand 2,000 tons.

The receipts at Buffalo, via. L. S. & M. S. R.R. for the week were 5,346 tons.

The exports of coal from Baltimore for the week were 305 tons, and for the year, 11,909, as compared with 29 871 tons to the corresponding time in 1874.

The decrease of shipments of Cumberland coal over the Cumberland Branch, and Cumberland and Pennsylvania Railroads, amounts to 60,648 tons.

COAL TRADE REVIEW.

Anthracite.—A strong demand continues, with stocks confined to the Delaware, Lackawanna and Western Railroad Company, Delaware and Hudson Canal Company and Pennsylvania Coal Company, and it is difficult for the ordinary buyer to get an order booked. Coal for short or prompt delivery is held considerably above circular prices, and is only offered by the contractors of the companies who may be fortunate enough to secure an occasional cargo. The resumption of all of the Delaware and Hudson Canal Company's men, with the opening of the canal, which will permit them to ship from a large stock, (estimated at about 510,000 tons,) at Honesdale, will increase the amount to be placed upon the market by about 15,000 tons a day. In addition to this there have been a number of collieries started in the Southern coal basin, which will add considerably to the above amount. Other collieries are expected to start soon, so that there is nothing to indicate a coal famine or a panic, even though the balance of the collieries do not start up for thirty days; while at the present writing there are strong indications that a large number, if not the whole, will resume before that time.

The Strike.—As reported by us last week, the miners, at a meeting held at Hyde Park, voted, by a large majority, to resume work upon the companies' terms; since then the whole of the Delaware and Hudson Canal Company's men have resumed. Notices were posted at the various collieries of the Lehigh and Wilkes-Barre Coal Company stating that a secret ballot would be taken on the 14th instant upon the question of resuming on the terms offered by Mr. PARRISH. This did not meet the views of certain of the miners, who, at a secret meeting, censured Mr. WILLIAM H. CARROLL, the President of the district, and compelled him, by threats, to revoke his action in the matter. It is thought that the men would have voted to resume; at all events, the action of those objecting is the best of evidence that a vote was feared, and another proof that a majority feeling is not always expressed by an open vote. The military have been retained at Hazleton, though no further outrages have been reported. In the Southern basin, some colliers have resumed upon the basis of 1874, and it is thought that a majority of the miners now on strike are willing to resume at the wages offered by the companies, but are afraid to give proper expression to their feelings There are men who appear to live as well without work as with work, and who are always prominent in strikes.

Fire in the Stockton Mines.—One would think that the danger of underground boilers had been sufficiently demonstrated by the large and expensive fires which occurred last year in the mines of the Lehigh and Wilkes-Barre Coal Company, and the Delaware and Hudson Canal Company, and that other companies would have profited by the lesson; but here we have another instance in the Stockton mines of the coal being ignited from a defective flue. At one time it looked as though it would be very serious, but at the present writing, although bad enough, it is supposed to be under control. We have been shown the following telegram from Dr. LINDERMAN: "We are confident fire is extinguished or under entire control." We trust these anticipations will be realized We are informed the manner adopted to extinguish the fire was to close the mine and inject steam, as was done successfully by the Lehigh and Wilkes-Barre Coal Company at its fire in the Kidder Slope.

Bituminous.—We are reported sales of considerable quantities of Cumberland coal to take the place of anthracite, and note from Boston that the contract for the Eastern Railroad Company's coal is for 40,000 tons, instead of 2 ,000 tons, as reported last week. Owing to the late opening of the Chesapeake and Ohio Canal, the unsettled question of tolls and the severe winter, the Cumberland production is about 60,000 tons behind the corresponding time of last year. The exports of coal from Baltimore are not one half of what they were the corresponding time last year. This is not surprising if the following, which we take from a private letter, dated Havana, April 3d, is applicable to other ports:

"Our market continues overstocked with coal; over 25 cargoes having arrived this week, and we see no immediate hopes of improvement."

Chesapeake and Ohio Canal.—No further action has been taken toward reducing tolls, which stand as reported by us several weeks ago. The boatmen, at a meeting, resolved to reduce freights to Georgetown from $1 35 to $1 25 per ton, provided the boat-owners will reduce trippage $10, or the canal company make no charge on empty boats returning, and the boat-owners reduce trippage $5.

The Cumberland Combination.—Another meeting has been held for the purpose of forming a combination to secure remunerative prices for the coal production of this interest, although but little headway has been made. A committee, composed of representative directors of the companies, has been appointed to confer with the companies not heretofore represented; but, from present indications, it will be some time before anything of importance can be done. Although but little may be accomplished this year, there will probably be found some way to settle all differences, and establish a combination upon a firm basis for next year's business.

Gas Coals.—There is but little doing in these coals. The larger gas companies have good stocks, and the smaller ones are being supplied from various sources There have not been any sales of Provincial coals, and at the present moment, the outlook is discouraging; but there will probably be some sales later in the season, when the gas companies find use for the coal. There is nothing to make it an object for buyers to anticipate their wants; they feel that they will be able to do fully as well three months hence, as now, and not needing the coal, consider it unwise to invest money in it.

The Strike of the Gas Coal Miners.—The strike in the Penn and Westmoreland district continues without any prospect of a speedy termination. The men at MOORE'S mines, on the Youghiogheny, are also on strike. The Waverly Coal and Coke Company's men are at work, and the Company continues to ship about 250 tons a day to Baltimore. This Company has a contract for wages with its men, for a year, subject to 60 days notice on either side. No notice has been given by either party, so that it is thought the Company will be able to continue its regular supply.

Freights.—From Baltimore and Georgetown to Boston, $2 is being paid; to the Sound $1 70; and to this city $1 50. Canal freights from Baltimore to this city are $1 55. From this city to Boston the nominal rate is $1 75.

Wholesale Prices of Bituminous Coal.

The following prices are principally fixed for the season, except where otherwise indicated.

Domestic Gas Coals.

Per ton of 2240 lb.	At the Shipping Ports.	Alongside in New York.
Westmoreland and Penn, at Greenwich, Philadelphia	$5 20	$6 50
" " at S. Amboy	6 00	6 50
Red Bank Cannel Pa., at Phil.	8 00	8 50
" " at S. Amboy	8 50	....
" Orrel, "	6 00	6 50
Youghiogheny, Waverly Co, at Baltimore	5 25	6 50
Despard, West Va., nominal "	4 75	6 50
Murphy Run, W. Va. at Baltimore, nom.	4 75	6 50
Fairmount, W. Va " nominal	4 75	6 50
Newburgh Orrel, Md. " "	4 75	6 50
Cannelton Cannel, W. Va., at Richmond.	9 50	11 00
" Splint, " " "	5 00	6 50
Peytona Cannel, " " "	9 50	11 50
Straitsville, " At Sandusky, O "	3 65	11 60

Foreign Gas Coals.

	Sterling.	Am. cur'cy.
Newcastle, at Newcastle-on-Tyne	....10/6@12/9	6 50@ 7 00
Liverpool House Orrel, at Liverpool	26/	13 00
Ince Hall Cannel "	47/	18 oc@20 00
" Gas Cannel "	30/	12 00
Scotch Gas Cannel, at Glasgow, nominal.	25/	7 50
	Gold.	
Block House, at Cow Bay, N.S.	2 00	5 50
Caledonia, at Port Caledonia	1 75	5 25
Glace Bay, at Glace Bay	1 80	5 50
Lingan, at Lingan Bay	75	....
Sydney, International and Reserve mines, at Sydney	2 00	5 50
Pictou, Albion and Vale mines, at Pictou	2 25	5 75

Steam and House Coals.

Broad Top, at the mine, $1,25; at Amboy	4 75@5 00	5 25@5 50	
Cumberland, at Georgetown and Alexandria, Va.	4 20@4 25	....@....	
Cumberland at Baltimore	4 40@4 50	5 75@6 25	
Clearfield, "Derby," "Kittanning," "Sterling," and "Eureka," at the mines, $1.25; at Greenwich, Phil.	4 60	5 65	
James River, carbonite, at Richmond, Va	6 75	9 00	
" bituminous, " nom.	4 00	6 25	

Retail Prices in New York.

Anthracite.

Per 2000 lb.	Grate and Egg.	Stove.	Chestnut
Pittston coal, in yard	$6 00	$6 20	$5 40
Lackawanna Coal, del'd	7 60	7 85	7 10
*Wilkes-Barre, delivered	7 60	7 85	7 10
Lehigh & Locust Mountain, del'd	8 00	8 00	7 50
Schuylkill Red Ash del'd	8 25		

The cost of delivering Pittston coal ranges from 40 cents to $1 per ton, according to distance from the yard.

* Twenty-five cents less than the above rates are charged to manufacturers.

Bituminous.

Liverpool House Orrel, delivered, per ton of 2000 lb			$23 00
Liverpool House Cannel	"	"	25 00
American Cannel	"	"	16 00
American Orrel	"	"	$15 00@16 00
Straitsville Cannel	"	"	15 00@16 00
Carbonite	"	"	12 00
Cumberland	"	"	9 00
Acadia, Pictou, N. S.	"	"	14

Wholesale Prices of Anthracite Coal f.o.b., at the Tide Water Shipping Ports per ton of 2240 lb.

The prices of the Lackawanna, Scranton and Pittston Companies, in the following table, are all that have been fixed as yet for the month of April.

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
Wyoming Coals.						
†Lackawanna and Scranton at Elizabethport & Hoboken	4 60	4 70	4 80	4 95	5 40	4 40
Pittston at Weehawken	4 60	4 60	4 70	4 80	5 30	4 35
Wilkesbarre at Port Johnston	....	....	....	....	....	....
Plymouth, R. A.	....	....	....	....	....	....
Susque. Coal Co. at Amboy W. A.	....	....	....	....	....	....
Kingston at Hoboken	....	....	....	....	....	....
Lehigh Coals.						
Old Company at Port Johnston	....	....	....	....	....	....
Old Company's Room Run "	....	....	....	....	....	....
Sugar Loaf at "	....	....	....	....	....	....
Lehigh Coal Exchange "	....	....	....	....	....	....
Honey Brook at Elizabethport	....	....	....	....	....	....
Spring Mt. C. Co. at Hoboken	....	....	....	....	....	....
Beaver Meadow at South Amboy	....	....	....	....	....	....
Schuylkill Coals.						
Schuylkill white ash	....	....	....	....	....	....
Schuylkill red ash	....	....	....	....	....	....
Shamokin white and red ash	....	....	....	....	....	....
N. Franklin	....	....	....	....	....	....
Lorberry	....	....	....	....	....	....
Lykens Valley	....	....	....	....	....	....

Pittston coal is delivered to carts in New York or Brooklyn at 65 cents per ton in addition to the above rates.

Per ton.	
Freight from Hoboken and Weehawken to New York	40c.
" " Elizabethport & Port Johnston to New York	45c.
" " South Amboy to New York	50c.

Freight from Rondout to New York, by boats or barges of the D. & H. Canal Co., 50c. per ton.

Baltimore, Md. April 13, 1875.

Reported by our Special Correspondent.

WHOLESALE PRICES PER 2240 lb.

ANTHRACITE.

	By cargoes.	In cars.
Wilkes-Barre, "Lee," or "Diamond,"		
Lump, steamboat	$5 15	$5 60
Broken	5 50	5 73
Egg	5 87	6 15
Stove	6 07	6 35
Pittston and Plymouth.		
Lump and steamboat	....	5 50
Broken	....	5 70
Egg	....	6 05
Stove	....	6 25
"Boston," freeburning white ash	....	5 50
Egg	5 87	5 70
Stove	6 07	6 05
Shamokin, (red or white ash)	....	6 25
Egg	5 82	6 05
Stove	5 92	6 15
Lykens Valley, red ash, egg and stove	6 02	6 55

From wharf or yard, wholesale, 50@75c. additional.
By retail, all kinds and sizes, per 2,240 lb, $7@8 25.

BITUMINOUS.

George's Creek and Cumberland f. o. b. at Locust Point for cargoes	4 60	4 75
West Va. Gas Coal f. o. b. at Locust Point	5 50	....
Kanawha Cannel, coarse	13 00	....
Tyrone	7 25	....
Ritchie Mineral of West Virginia	1 00	....

Boston. April 13, 1875.

Reported by our special correspondent.

We see by your last paper that the contract to the Eastern Railroad was 20,000 tons. It should be 40,000. It was taken by the "George's Creek Company" at a figure under $4 20 at Baltimore. Many of the manufacturing companies are arranging to use Cumberland instead of anthracite, being satisfied it will answer every purpose. The retail yards are very bare.

CARGO PRICES TO TRADE.

Lingan coal	$ 5 75	Westmoreland, and Penn.	7 25
Caledonia	5 00	Waverly Co. Youghiogh'y	7 25
Pictou	6 15	Cannelton Cannel	11 75
Block House	5 60	Cumberland	6 25@ 6 50
Red Bank Cannel	10 00	Anthracite,	6 50@ 7 25
Glace Bay	5 00	" Retail	7 50@ 8 00
Sydney	7 00		

The *Commercial Bulletin* says:

"The course of the market seems now to be steadily upward. The scarcity is making itself felt very severely, and we notice that coal has been brought to Boston this week from Salem. Every day dealers from out of town come in urgently soliciting a small supply, and go away without it. Some very cool-headed men, who have carefully examined the situation, have begun to express fears of an approaching coal panic. Still there is no disposition on the part of either operators or wholesale dealers to advance prices, as it is evident they could make very little outright by the operation, the stock of coal being now so light, and, on the other hand, the effect on the miners would be very disastrous, as it would vastly strengthen their disposition to hold out

"Cumberland coal, which is generally higher than anthracite, is now lower. Its present relative cheapness is partly owing to the scarcity of anthracite, and partly to the fact that extra inducements are made to ship this coal from the unprecedented low tariff rates which the railroad war has put in force on both the Pennsylvania Central and the Baltimore and Ohio. The cargo price for this coal, delivered here, is now $6 25@6 75. Steam users continue to substitute Cumberland for anthracite, and this is one of the most marked features of the present situation. Many mill owners assert that they have long been contemplating the change, not entirely because of the present troubles, but partly because of the uneasiness which the knowledge that the anthracite market is practically in the hands of one man must constantly inspire. The expense incident to the change is slight. Several of the Lowell and other mills which have all along used antharacite, have this week made long-time contracts for Cumberland.

"Gas coals are dull. In the Provinces they are still snowed up. Hence no fresh-mined has been received yet, and there will be none for several weeks."

Buffalo, N. Y. April 13 1875.

Per ton of 2000 lb.

	Slack.	Nut & Slack.	Nut.	Lump
Connelsville coke				5 80
Sterling cannel				6 00
Red Bank				5 75
Youghiogheny coal for gas				4 75
Briar Hill coal		3 25		4 85
Monterey "		3 25	3 60	3 75
Catfish "		3 25	3 60	3 75
Stoneboro "	2 75		3 75	

Briar Hill coal, and Stirling and Red Bank cannels retail at $7 50; all other coals $1 per ton above wholesale prices.

Anthracite f. o. b. vessel.

Grate	6 70	Stove	7 15
Egg	6 70	Chestnut	6 65

Retail prices delivered and screened, $1 per ton additional.

Chicago, Ill. April 13, 1875.

Specially reported by Messrs. RENO & LITTLE, Coal Merchants

No change in prices of Anthracite

Retail prices per ton of 2000 lb. delivered to buyer.

		BITUMINOUS.	
Lehigh Lump	$10 75	Briar Hill and Erie	7 50@ ....
Lehigh prepared and car load lots	10 25	Walnut Hill (W. Va.)	6 50@ ....
Lackawanna, Wilkes-Barre and Pittston,*		Midway (West Va.)	6 50@ ....
Grate, egg, and chestnut	10 00	Cannel	8 00@ 9 00
Stove or range	10 00	Blossburg	8 00
		Indiana Block	6 00
		Hocking " Brooks"	6 00
		Wilmington and Illinois	5 00

*75 cents off these prices for car load lots to country dealers and manufacturers.

Cincinnati, O. April 13, 1875

Coal trade here very dull, and no material change in prices. We quote:

Per ton of 2000 lb.

	Bush.	Ton.
Youghiogheny, or Pittsburgh, afloat	8½c.@9c.	—
Pomeroy coal	6c.	—
Cannel coal	16c.	—
Semi Cannel	8c.	—

The following are retail prices delivered:

Youghiogheny	— c.	$3 35
Pomeroy	— c.	2 80
Cannel	— c.	5 60
Kanawha Semi Cannel	— c.	3 35
Anthracite		9 50
Foundry coke	8c @10 c.	—
Soft coke	8 c @10 c.	—

Cleveland, O. April 13, 1875.

Reported by our Special Correspondent.

Per ton of 2000 lb. on cars.

Youghiogheny, l'p	$4 40	Columbiana	$3 00
Youghiogheny, nut	3 40	Strip Vein	3 20
Briar Hill, according to quality	$3 85 to 4 00	Mountain Blossburg (blacksmith)	5 50
Massillon	3 65	American Cannel Coal Co.s Cannel	4 50
Hocking Valley	3 25		
Straitsville	3 25		
Anthracite, Lackawanna on cars, Egg			$6 85
" " " "		Stove	7 50
" " " "		Chestnut	7 00
Youghiogheny Coke, " "		here	5 25
Connellsville " " "		"	5 50

50 to 75 cents per ton additional for delivery at retail.

Detroit, Mich. April 13, 1875.

Specially reported by Messrs. ROBINSON & KEYS, dealers in all kinds of coal.

The market is very quiet, but little or nothing doing in domestic coals The opening of navigation will improve the demand for steam coal. Prices are unchanged.

Per ton of 2000 lb.

Lehigh Lump, per ton	$10 50	Blossburg	8 50
Lehigh " prep. sizes	10 00	Briar Hill	7 50
Wilkes-Barre, Grate and		Willow Bank	7 00
Egg	9 00	Erie	7 50
Wilkes-Barre, Stove and Nut	9 50	Massil on	7 00

Erie, Pa. April 13, 1875

Reported by our Special Correspondent.

Wholesale, per ton of 2,000 lb.

Bituminous f.o.b.

Briar Hill lump	$4 00	Beaver lump	$4 00

Indianapolis, Ind. April 12, 1875.

Specially reported by Messrs. H. McCOY & Co.

Per ton of 2000 lb.

BITUMINOUS.

Wholesale on board cars in city.

Block coal	$2 50@2 75	Indiana cannel	6 75
Best "	2 40@ 2 50	Hocking Valley	4 25
Block Nut, per car	18 00	Youghiogheny	5 00
Highland " "	18 00	Blossburg (smithing)	6 50
Block slack, per car load		Piedmont "	7 75
Peytona, cannel per ton	8 75	Gas coke, per bushel	80

ANTHRACITE (Lackawanna).

Grate	$8 70	Chestnut	8 60
Egg	8 70	Stove	8 85

Retail, per bushel of 70 lb

Block	16c.	Peytona Cannel	32c.
Highland	14	Indiana "	26
Highland Nut, dom. use	9	Youghiogheny	24
Block " "	9	Blossburg	26
Slack, steam. "	8	Piedmont	30
Block & Highl'd Mt. steam—			

ANTHRACITE.

per ton.		per ton.	
Grate	$11 00	Stove	$11 00
Egg	11 10	Chestnut	11 00

Louisville, Ky. April 13, 1875.

Specially reported by Messrs. BYRNE & SPEED.

Please report our market the same as last week, with a slight decline in wholesale price, and tendency to lower prices, generally.

Pittsburgh, per load of 1900 lb	$3 50
Pine Hill	3 00
Buckeye Cannel	5 00
Peytona Cannel	5 50
Nut and Slack	2 25
Pine Hill nut	2 25
Kentucky lump, per load	
" nut, "	
" Slack "	
City-made Coke, per bushel	
Pittsburgh, wholesale, per bush.	
Kentucky on cars at wholesale, per bush.	
Anthracite, per ton	$10 to $10 50

Milwaukee, Wis. April 12, 1875.

Specially reported by Messrs. R. P. ELMORE & Co.

Retail prices per ton of 2000 lb.

Lehigh Lump	$10 00	Briar Hill, select	$8 50
Lehigh Prepared	10 50	Blossburg	8 00
Lackawanna	9 50	Pittsburgh	7 50

New Orleans, La. April 10, 1875.

Pittsburgh coal, retail, per bbl	75c.
" wholesale	35c.
" to steamboats, per box	50c.
" to manufacturers, per bbl	60c.
" shipments per hhd	$7 00
Anthracite, retail, per ton	$12 00@13 00
" wholesale per ton	8 00
Spadra (Arkansas) coal, retail, per bbl	75c.
Mt. Carbon, wholesale, per bbl	45c.
" retail per bbl	65c.
Virginia Cannel, per bbl	90c.
Scotch Cannel, per bbl	1 00

Pittsburgh, Pa. April 13, 1875.

Reported by our Special Correspondent.

Mines on the river are running pretty full, the general price for mining being three cents per bushel. The same price for mining rules on the railroads, with dull trade, however. The demand for Connellsville coke for Eastern shipment has made the price firm at $2 50 per ton on board cars here. There appears to be a little uneasiness existing among the coke burners, but it is to be hoped they will have the good sense to "make hay when the sun shines," as it is more than probable the demand for coke will fall off when the anthracite mines resume operations.

Per ton of 2000 lb. and Bushel of 76 lb.

per ton.		per ton	
Youghiogheny coal	$2 00	Pittsburgh retail delivered per bushel	9c@10c
" coke	2 00@2 25		
Connellsville coal	2 10	Anth'cite on cars Lehigh	$7 75
" coke	$2 25@2 50	" " Wilkes-Barre	6 75
Pittsburgh coal	1 85		

Twenty-five to fifty cents per ton additional for delivery.

San Francisco

From the *Commercial Herald*, April 1, 1875.

Imports from January 1st to March 16th, 1875:

Anthracite, tons	3,047	English, tons	19,358
Australian, tons	18,089	Vancouver Island, tons	14,080
Coos Bay, tons	6,518	Rocky Mountain, tons	24
Cumberland, tons	1,637	Seattle, tons	6,633
Mt. Diablo, tons (2 mos.)	28,525	Bellingham Bay, tons	1,840

The market for spot cargo parcels Australian, afloat, has been poorly supplied of late, giving dealers a chance to work a portion of their surplus stock at a slight advance from late ruling rates. Imports for the week embrace 200 tons from New York, per *St. Lucie*; 969 tons from Boston, per *Spartan*; 800 tons from Liverpool, per *Great Admiral*, etc. There is no Cumberland in first hands, all here held by the dealers. The California Mt. Diablo supply is liberal; and this, with other coast mines now being developed, promises a large increase ere long. Black Diamond and other Mt. Diablo Coal is exclusively used for steam purposes by factories and inland steamers. The coarse commands $8 25 and the screenings $6 25 per ton—the latter preferred by many of our mills on the score of

economy. We quote Coos Bay at $10; Wellington, $11@12; Australian, by the cargo, $10@$10 50; Bellingham Bay, $8 50. The *Iconium*, from British Columbia, brought down 896 tons Wellington.

Toledo, Ohio. April 13, 1875.

Specially reported by Messrs. GOSLINE & BARBOUR.

The following are the quotations on Anthracite and Bituminous coals at Toledo:

Per ton of 2000 lb. on cars.

Hocking Valley	$3 40	Massillon	4 20
Straitsville	3 40	Youghiogheny	5 00
Shawnee	3 40	Blossburg	7 50
" nut	2 90	Cumberland	7 50
Briar Hill	5 50	Connellsville coke	7 00

Anthracite.

Grate, screened	$7 75	Stove, screened,	$8 25
Egg "	7 75	Chestnut "	7 75
Lehigh Lump	9 50		

40 cents to $1 per ton additional for delivery at retail.

Halifax, N. S. April 12, 1875.

Reported by our Special Correspondent.

Prices per ton of 2240 lb. in gold.

Sydney (old mines)	$4 50	Little Glace Bay	3 50
Gowrie	3 50	Blockhouse	4 00
Victoria	3 50	Albion (at Railroad)	4 25

Montreal. April 13, 1875.

Specially reported by Messrs. ROBERT ADAMS & CO.

Wholesale per ton of 2,240 lb.

Scotch Steam	$6 25	Cape Breton Steam	$5 75
Picton "	6 00	Newcastle Smiths	

Anthracite at retail, 2,000 lb., delivered, less 5 per cent.

Egg	$8 50	Chestnut	9 00
Stove	9 50		

Toronto, Ont. April 12, 1875.

Reported by our Special Correspondent.

ANTHRACITE.

	per ton.		per ton.
Broken	$7 65	Chestnut	$7 65
Egg	7 65	Lehigh	9 00
Stove	8 15		

BITUMINOUS.

Blossburgh	7 50	Screenings	5 00
Briar Hill	7 00	Soft Nut	5 50

Rates of Transportation on Anthracite Coal to Tide Ports.

Lehigh and Wyoming Coals. per ton of 2240 lb.	From Penn Haven.	From Mauch Chunk.	From Hazleton.*	From Upper Lehigh.	From Ashley and Sugar Notch.
To ‡ Newark, N. J. via Central Railroad of New Jersey	2 89	2 73	2 86	3 24	3 45
‡ Mauch Chunk, Pa. via Central Railroad of N. J.	16	..	56	51	72
‡ Phillipsburg, N. J.	1 09	93	1 34	1 44	1 65
‡ Elizabethport, Port Johnston, Hoboken and South Amboy, N. J. shipping and wharfage 35c. add.	2 47	2 31	2 80	2 82	3 03
High Bridge, N. J.	2 40	2 20	2 80	2 79	3 09
Somerville and Raritan, N. J.	2 80	2 60	3 20	3 19	3 49
Elizabeth, Cranford, Westfield and Elizabethport, for consumption.	2 95	2 75	3 35	3 34	3 64
¶ Jersey City, N. J., and New York, via Morris Canal	2 85	2 35	3 17	3 24	3 54
Andover, via Delaware, Lack. and and Western RR	3 30	3 10	3 70	3 69	3 99
§ Trenton, Somerset Junction and Greensburg, via P. RR. Belvidere Division	2 65	2 45	3 05	3 04	3 34
Trenton, for shipment, including shipping and wharfage	2 11	1 95	2 45	2 46	2 76

* Rates on line coal from Hazleton are 10c. per ton above these figures.

‡ The cost of unloading is to be added to these rates. No charge less than 40c per ton will be made for any distance. Tolls from Mauch Chunk to Phillipsburg for way points will be $1 15 per ton.

§ Twenty cents per ton less when five cars at a time to one party. Provided that where the reduction makes the rate $1 a ton, or less, the rate will be $1.

¶ 20 cents per ton additional for transferring coal from boat to boat, and 30 cents per ton for reshipment of same from wharves.

The following rates of freights and tolls on Schuylkill coals are to take effect from and after March 1, 1875:

Schuylkill Coals. per ton of 2240 lb.	From Pine Grove.	From Tamaqua.	From Port Carbon.	From Mount Carbon.	From Schuylkill Haven.
To * *Port Richmond*, for shipment, via P. & R. R. R. Main Line	1 87	1 82	1 75	1 74	1 67
Philadelphia, Reach yards	1 97	1 92	1 85	1 84	1 77
Harrisburg, via Lebanon Valley Branch	1 23	1 80	1 73	1 72	1 65
Allentown, via East Pennsylvania Branch	1 52	1 47	1 40	1 39	1 32
Lancaster, and Points on Lancaster Branch, via R. & C. R.R.	1 57	1 52	1 45	1 44	1 37
Dauphin, via Schuylkill and Susquehanna Branch	62	....	1 25 via Aub	1 24 urn.	1 17
Jonestown, via Lebanon and Tremont Branch	86	....	1 69	1 68	1 61
Lebanon, via Lebanon and Tremont Branch	90	....	1 88	1 87	1 80

* On and after March 1, 1875, a charge of fifteen cents per ton will be made for shipping anthracite coal at this point.

From *Tamaqua* to *Catawissa*, via Catawissa and Williamsport Branch Railroad 94

From *Tamaqua* to *Williamsport*, via Catawissa and Williamsport Branch Railroad 1 39

Freights on Bituminous Coals from the Mines to Tide-Water Shipping Ports.

From the Mines to Cumberland and State Line (say an average of 20 miles) the charge is 3 cents per ton of 2240 lb. per mile.

From State Line to Amboy (346 miles) $3 75 per ton of 2000 lb. On coal shipped beyond this point there is a drawback of 50 cents per net ton.

From Cumberland to Baltimore, (178 miles) $2 31 per ton of 2240 lb., or $2 07 per net ton, and 4 cents per gross ton for use of cars.

From Cumberland to Georgetown, (152 miles) by canal. The Canal is open but shipments for the season as yet have not aggregated over 1,000 tons; present rate, $1 25.

From the Mines to Piedmont, (from 4 to 10 miles) 5 cents per ton of 2240 lb per mile on distances less than 5 miles, and 4 cents per ton per mile on distances not over 10 miles.

From Piedmont to Baltimore, (206 miles) $2 69 per ton of 2240 lb., or $2 40 per net ton.

From any point in the Kanawha Valley to the James River wharves below Richmond, (say 350 miles) by C. and O. R. R., including terminal charges, per ton of 2240 lb or Cannel coal, $4 50.

Do., do., for Semi-Cannel or Splint, per ton of 2240 lb., subject to rebate on shipments of 5000 tons or more, $3 65.

From Irwin to W. Phila (say 332 miles) per P. R. R. Penn. Westmoreland gas coal, per ton of 2000 lb $4 75

From Osceola to W. Phila. (say 248 miles) per T. & C. R. R., per ton bituminous coal of 2000 lb 3 30

From Fairmount and Clarksburg to Baltimore (say 300 miles) via B. & O. R. R., including loading, per 2000 lb 4 75

On through coal after deducting drawback ....

From Richmond, Va., to New York, via vessel, 392 miles per 2240 lb.. 1 75

" " " *Boston*, about 650 " " " 2 25

" " " *Philadelphia*, 292 " " " 1 25

From the Mines to Richmond, via James River and Kanawha Canal, 15 miles 15

Freights.

Per ton of 2240 lb.

PORTS.	From Baltimore and Georgetown.	From Elizabethport, Port Johnson, South Amboy, Hoboken and Weehawken.
Augusta, Me	....	....
Albany	....	....
Amesbury, Mass	....	....
Bangor, Me	....	....
Bath, Me	2 00	....
Baltimore	....	....
Boston, Mass	2 00	1 80
Bridgeport, Ct	1 70	85
Bristol, Ct	....	1 30
Derby	....	1 10
Dighton	....	....
East Cambridge	....	†† 1 80
Fall River	1 70	1 30
Hackensack	....	....
Hartford	....	1 40
Hoboken	....	....
Hudson	....	....
Jersey City	....	....
Middletown	....	....
Mystic	....	....
Newark	1 60	....
New Bedford	2 10	1 30
Newburyport	2 15	2 00
New Haven	1 70	85
New London	1 70	1 00
Newport	....	1 30
New York	1 50	§ 40
Norfolk, Va	....	....
Norwalk	....	1 00
Norwich	....	1 15
Pawtucket	....	‡‡ 1 40
Philadelphia	90	....
Portland	2 00	1 75
Portsmouth, N. H.	....	1 90
Providence	1 70	1 30
Petersburg, Va	....	....
Richmond, Va	....	....
Rockport	....	....
Saco	....	2 10
Sag Harbor	....	1 15
Salem	2 00	1 80
Savannah, Ga	....	....
Stamford	....	85
Stonington	....	1 10
Taunton	....	1 80
Trenton, N. J	1 10	....
Troy	....	....
Warren	....	1 30
Washington	....	....
Wareham	....	1 30
Wilmington, Del	90	....

§ Under 150 tons, 50c. per ton.
†† 30c. per ton per bridge extra.
‡‡ Towing extra.
Rates from Baltimore to New York by barge $1 60.

THE BRITISH COAL AND IRON TRADES.

March 27, 1875.

North of England.—The gas collieries are well employed, but for steam, manufacturing and house coals the demand is light, and it is with difficulty that the pits are kept at work. Coke is easy, excepting for best qualities which are scarce. The Monkwearmouth pitmen have not yet resumed work. They still refuse to work with non-Union men. The Miners' Union disapproves of their conduct and refuses to help them. The Durham labor question has not yet been brought to arbitration, owing to the inability to procure a gentleman qualified to act as umpire. Unscreened coal is quoted at the pits at 5/@6/; screened, 7/@8/; best household, 14/@15/ 6d; secondary sorts 10/@12/; coke, 15/@17/. The iron trade continues very dull, although there is a little more inquiry for forge iron, caused by some additional work being placed with manufacturers on account of the South Wales strike. Prices, however, are so low that manufacturers have no desire to do work, as they consider that they would be doing it at a loss. No. 1 Foundry is quoted at 63/; No. 2, 60/; No. 3, 58/ 6d.; No. 4, 57/; No. 4, forge, 56/; Rails, £7@£7 10.

Barrow-in-Furness.—As compared with other districts, a very fair amount of business is doing. This is brought about by a demand for iron for the manufacture of tin plates, which would go to the South Wales district if it was at work, and by a good demand from Bessemer steel works. A good number of inquiries have been made during the past week, and some orders placed. But little trade is anticipated this season from the Continent. The demand for steel wire, billets, bands, &c., is not as brisk as it has been. The iron shipbuilding trade continues very brisk, and in most departments overtime is being made. The finished iron trade is very dull, and prices unremunerative. The general coal trade is firm. No. 1 Bessemer pig iron is quoted at £4 10/; No. 2, £4 7/ 6d.; No. 3, £4 5/.

Wolverhampton.—The coal trade is very quiet as regards steam and furnace coals but the demand for house coals at the Comstock chase collieries has been quite buoyant during the past fortnight. The commonest samples of furnace coal have changed hands this week at 9/@10/ per ton. The iron trade continues in a very unsettled state. The commoner qualities of both pig and finished iron are being disposed of at less than cost of producing, common cinder pig is quoted at £3@£3 5/; mixed mine £4@£5; Shropshire cold-blast £6 10/ per ton. Best thick coal is quoted at 18/; seconds, 13/, and lumps, 12/.

Yorkshire and Derbyshire.—The coal trade is very dull; some of the collieries being compelled to stand idle as much as two days a week. At all the railway collieries cars are standing loaded, not being able to find sale. At Sheffield there is a better demand for Bessemer steel rails, and the various establishments are again exhibiting something like activity. Crucible steel has been in steady request, and some good orders for railroad springs are now in hand.

Lancashire and Cheshire.—In the Manchester district the better classes of coal are firm, at 15/ for best house coal; seconds, 12/@13/; furnace, 11/@12/; best forge, 7/ 6d.@8/; best slack, 5/6d.@6/; common slack, 4/@4/6d.; screened gas coal, 14/; unscreened, 10/@11/; ordinary cannal, 22/6d, all at the pit mouth.

Monmouthshire and South Wales.—At Newport, the non-associated collieries are actively employed, and it is reported that the highest prices yet attained have been obtained for coal. At Cardiff great difficulty is experienced in disposing of the coal sent to the port. The iron trade is almost suspended. There are no new features in the strike. Thousands are suffering for the necessaries of life, and there are no indications of resuming. It is now reported that further reductions of wages will be insisted upon. Double screened steam coal is quoted at 19/@20/, f.o.b. Cardiff; colliery screened, 18/@19/; small, 6/ 6d.@7/ 6d. Hotblast foundry iron is quoted at £4@£4 10/; forge, £3 15/; refined, £4; common bars, £9@£9 10/.

Scotland.—Business in the warrant market during the week has been exceedingly flat, and prices have fallen from 6d. to 1/ per ton. Friday's market was dull, with but a limited number of transactions, at 72/ 3d. and 72/. Matters were even worse at the opening of the present week, when about 3,000 tons of warrants changed hands at 72/ cash. Transactions have been impeded by repeated reductions announced by several of the principal makers. These reductions varied from 1/ to 2/ 6d. per ton, and as they have been made by the chief and ruling firms, the reduction may be held as a general one. The prices of the principal makers' brands are now as follows:—Gartcherrie, No. 1, 82/ 6d.; No. 3, 76/; Coltness, 86/ and 74/; Summerlee, 85/ and 74/; Langloan, 84/ and 73/; Govan, 74/ and 72/; Calder, 85/ and 74/; Shotts, 86/ and 76/; Carnbroe, 80/ and 72/; Monkland, 74/ and 72/; Clyde, 75/ and 73/; Glengarnock, 82/ and 73/; Eglinton, 73/ and 69/; Dalmellington, 72/ and 70/; Kinneil, 80/ and 72/; Carron, 75/ and 72/ 6d. There is little alteration in the quantity of pigs in store from those of last week. The shipments of pig iron from Scotch ports during the week show a considerable reduction as compared with those of the corresponding week of 1874. The imports of Middlesbrough pigs at Grangemouth for the week amounted to 2,530 tons, being a decrease of 1,545 on those of the corresponding week of last year. Since Christmas, however, there is a total increase of 7,638 tons on these imports as compared

with those of the same period of 1874. Last week there was a considerable increase in the cargoes of coals shipping to foreign parts from Clyde ports, but the market remains much over-stocked. Prices are unchanged since last report, but coal masters are now making complaints that their profits are inadequate, and the probability of another reduction of miners' wages is freely talked of as a thing that will become necessary should the market not take a favorable turn. So far as can be seen there is no prospect of a change for the better being near at hand, and the chances are that when the dispute in the Eastern mining counties is settled, or perhaps even sooner, a reduction will be announced. The miners are not at a l prepared for resistance. The prolonged strikes of last summer broke their Unions to pieces, and only a very small proportion of the mining population are now in union. Many societies have, since the beginning of the year, been broken up, and there is great apathy among the men on the subject. Attempts which are being made to recruit the membership of existing societies and re-establish lopped ones, have in the main been unsuccessful. The only persons present at "a great mass meeting" held at Wishaw, a few evenings ago, were the speakers and a couple of newspaper reporters; yet this is one of the very largest and most important mining centers in Scotland. Household coals are selling at from 9/@ 14/; Wishaw Main, 8/6d@9/6d; steam, 10/@12/; smithy, 15/6d.; splint, 9/3d.@10/.

IRON MARKET REVIEW.

Import Duties.

The following are the duties in Gold on Iron:

Flat Iron, not less than 1, nor more than 6 inches wide, nor less than ⅜, nor more than 2 inches thick. *Round Iron*, not less than ¾, nor more than 2 inches in diameter, and *Square Iron*, not less than ½, nor more than 2 inches square per pound 1 c.
Flat Round or Square Iron, of larger or smaller sizes than the above mentioned, per lb ..... 1½c.
Provided, that all iron in slabs, blooms, loops, or other forms, less finished than bars, and more advanced than pig iron, except castings, shall pay the same as iron in bars.
Provided, that none of the above iron shall pay less than 35 per cent.
Railroad Bars—Iron.....70c. per 100 lb.
Railroad Bars—Steel.....$1.25 per 100 lb.
Boiler plates, or other plate iron not less than 3-16 of an inch thick, per lb ..... 1½c.
Scrap castings per ton $5 40
" *wrought* " " 7 00
Pig iron per ton 7 00
Iron ore 10 per cent. *ad valorem*.

New York.

April 16, 1875.

American Pig.—There is not the least improvement in the demand, and the prospects are not encouraging. We are unable to learn of a sale worthy of note. The coal troubles are not so serious as they were last week, the output having been considerably increased, although the large majority of the men who originally struck are still out. There are greater indications of resumption than at any time since the strike began. The furnace companies feel more easy about their supply of coal, and the Thomas Iron Company has countermanded its order for coke. Prices of pig iron are nominally $28 for No. 1 Foundry; $26 for No. 2; and $24@$25 for Forge. These, perhaps, are the figures being paid for small lots, but to force any quantity upon the market, and especially brands with reputations not fully established, considerable concessions would have to be made. As an evidence of this we note an attempt to sell 500 tons of No. 1 Allentown, where the best bid was only equal to $26 50 delivered at Hoboken. There is no doubt that iron can be bought below regular quotations. Navigation is sufficiently open to increase the demand from markets heretofore closed, if any is to come, which does not appear to be the case. Our local foundries are very quiet especially those doing architectural work. In fact, this branch of business is more quiet than last year.

Scotch Pig.—The market for this article is completely demoralized, and it is impossible to give its true state. The arrivals have been quite large during the last month, and importers are compelled to put iron in yard, being unable to procure satisfactory prices for it, although it has been offered considerably below cost of importation. There is no demand worthy of note from consumers, and dealers, anticipating further large arrivals, expect to see still lower prices The present stock is from 1,500 to 2,000 tons, of which about 1,000 tons is Coltness. With but a moderate demand, this stock would not have a depressing effect, but with the demand that has ruled for several months, and no encouragement in the early future, it is considered a great surplus. The weakness is increased by reports from Glasgow of a decline in the price of iron and freights, the latter being obtainable now at 5s., as compared with 7s. 6d.@ 10s. a few weeks ago. Eglinton is being offered to arrive at $30, and Coltness at $35. We quote nominally at $32@$33 for Eglington: $36 for Glengarnock; and $35 50@$37 for Coltness.

Rails.—There have been no transactions, although there is some inquiry which will probably result in business. We quote American at $48@$50 at mills, and Bessemer at $72 50@$75.

Old Rails.—There have been no sales since our last. We quote nominally at $30.

Scraps.—We note a sale of 300 tons on private terms and quote at $35.

Boston.

April 7, 1875.

The *Commercial Bulletin* says:

"*Pig* is exceedingly stupid. The long continued, unbroken severity on interest accounts and warehouse charges is being felt in odd places and on prime brands, not that the market shows enough soft spots to suggest a weakening, but it does begin to show an anxiety to realize. Broker A calls to-day and offers No. 1 X at $31, and, on departing, remarks, 'Don't buy until you see me again.' Next day he comes in, learning B has been around, and wants to know 'if 50c. won't be an object.' Then, failing to effect a sale, retires, urging the buyer not to consider he refuses $30. In a day or two, in pops B, who learns the situation, and quotes $29 75, and hardly closes the door when Broker C happens in, 'controlling a private lot of No. 1 X, and wants an offer bad.' The situation is discussed, merits of brands reviewed, and he finally tries to cajole the trade at $29 50. Failing in this, he goes off mad 'at the man who doesn't know a bargain when he sees it.' The movements of a trade are further blocked by some New York and Philadelphia party who drops along to sell a round lot in a 'quiet way, so as not to break the market over there,' which fact, judiciously worked by the buyer, starts the brokers bidding against themselves, until good No. 1 X is offered here, to cash or prompt-paying buyers, at $28 50. Some one or two of the trade have thought our reports rather discouraging to the market, and that they have a tendency to depress the trade. They are each week carefully drawn, and at times over-conservative statements of business, with not a whit of fancy work in them, no more than such incidents as are briefly narrated above are. There may be a good many plausible reasons why iron should be higher, but the old saw, 'All signs fail in dry weather,' is applicable to the pig iron business, which is so remarkably dependent upon the demand. The quotations here are $32@33 for fancy brands, with occasionally one or two sales at the inside figures. The primary markets still quote $27@28 for No. 1, $24@26 for No. 2, and gray forge, $24@27. Scotch pig slow, and quotes Eglinton, $34@35; Glengarnock, $37.

"*Bar* has received a little more attention, $60 being the quoting price. We know of machine builders who have bought at $57 50 on thirty-day time, and of dealers who cannot replenish short of $60, while single bars have been peddled out of stock at $59. The market this week seems to be in a hitch between advancing a dollar a ton or settling back to $58@59. If the Pittsburgh mills roll, they must ask better prices. If they advance, the workmen will demand their portion. An advance there will stimulate a number to try their luck at present prices, and the success with which an advance could be sustained would depend largely upon the courage and the capital of the low priced mills to continue to run. The stocks of iron in jobbers', distributors', and manufacturers' hands is exceedingly light, probably never so small as now. There must be a necessity to replenish soon, and immediately that they come along to buy, everybody is likely to need a little more than will fill pressing necessities, hence the purchases are likely to strip the stock now on the market, and materially assist an advance. Such are the different impressions thrown out by the disconsolate and the sanguine dealers.

"*Steel* is having a steady trade for tires and small tools, the purchases being all in small lots. We quote American tool, 15@15½c.; American Machinery, 9½@10c.; do. tires at 6½@ 7c.; English Tool, 16@17c.

"*Copper* is a trifle stronger, without developing any noticeable increase of business. A speculative inquiry for futures is again developing, but without any definite indication as to whether present prices are tempting or not. Quotations for spots and futures range from 21⅛c. to 21¼c. Manufactured goods are in a little better request. We quote New Sheathing, 28c.; Bolts and Braziers, 30c.; Yellow Metal Bolts, 28c.

"*Lead* has rallied a trifle from the effect of the purchases of the grinders, who are preparing for the spring's business. Pipe makers are also doing a little more. The extending of the water supply in nearly all the cities of the Union has stimulated an inquiry for lead pipe. We quote domestic, 5¾c. Sheet and Pipe, 9c. currency; Tin-Lined Pipe 16½c.; Bar Lead, 9c., less usual trade at 10 per cent discount.

"*Spelter* is firmer at 6½c. currency.

"*Tin* is quiet, although a little better feeling is talked of. We quote at 21½@22c. gold for Straits. Refined English is unchanged for 21@21¼c. gold. Plates are active. We quote Charcoal I. C,, $10@12 50; Coke, $8@10; and Terne at $8@ $12 50 per box, currency."

Cincinnati.

April 12, 1875.

Specially reported by Messrs. TRABER & AUBERY, commission merchants for the sale of pig iron, blooms, ore, etc.

With a fair demand for pig iron and light stocks, the market is firm, and best brands of hanging rock foundry are now generally held at $30—4 months—for No. 1. For cold blast iron the demand is improving without change in prices.

CHARCOAL.

Hanging Rock, No. 1, Foundry	$28 00@30 00	—4 mos
" No. 2, "	27 00@28 00	—4 mos
" Mill	26 00@	—4 mos
Tennesse No 1, Foundry	27 00@28 00	—4 mos
Tennessee. No. 2 "	26 00@27 00	—4 mos
" Mill	26 00@	—4 mos
Missouri, No. 1, Foundry	30 00@32 00	—4 mos

STONE COAL.

Ohio No. 1, Foundry	27 00@28 00	—4 mos
" No. 2, "	26 00@27 00	—4 mos
Ohio Mill	25 00@26 00	—4 mos
Missouri, No. 1, Foundry	28 00@29 00	—4 mos
" No. 2, "	27 00@28 00	—4 mos
" Mill	26 00@—	—4 mos

CAR-WHEEL.

Hanging Rock, C. B	45 00@50 00	—4 mos
Tennessee "	40 00@45 00	—4 mos
Missouri "	40 00@45 00	—4 mos
Alabama "	40 00@45 00	—4 mos

BLOOMS.

Charcoal	75 00@ 85 00	—cash

SCRAP IRON.

Cast	75@	90	—cash
Wrought	1 25@	1 50	—cash

Chicago.

April 12, 1875.

Specially reported by Messrs. ROGERS & Co., dealers in Scotch and American pig iron.

Quotations are as follows:

No. 1 Coltness	$46 00@ ....
No. 1 Gartsherrie	45 00@ ....
No. 1 Summerlee	44 00@ ....
No. 1 Glengarnock	42 00@ ....
No. 1 Eglinton	40 00@ ....
Warner's "American Scotch"	41 00@ ....
Massilon No. 1 Foundry	37 00@ ....
No. 1 Grand Tower Mo. ores (Bituminous)	33 00@ ....
No. 2, " " "	30 00@ ....
No. 1 Mill	28 00@ ....
Union "A" 1 (Anthracite)	32 00@ ....
Union "B" 1 (Anthracite)	30 00@ ....
No. 1 Lake Superior (charcoal)	32 00@ ....
No. 2 Lake Superior "	30 00@ ....
No. 3 Lake Superior "	33 00@ ....
No. 4 Lake Superior "	35 00@ ....
Bessemer Steel Rails	85 00@90 00
New Iron Rails	55 00@ ...
Old Rails	28 00@30 00

The prospects of iron and steel manufacturers in the West are, on the whole, encouraging. All of our steel rail mills are full of orders, having enough for nearly the whole year ahead. The Joliet mills are doing well. Last month they turned out 3400 tons of steel rails—being idle four days during the month. During five and one-half days recently they turned out 1135 tons of steel ingots.

The new rolling mill of the Union Rolling Company starts up to-day. They have been making steel ingots while the rolls were idle.

We hear of a large sale of charcoal pig iron by the Scotia Iron Company of Missouri (amounting to 6000 tons) to the following parties: Pennsylvania Steel Works, Harrisburg, 3000 tons; Joliet Iron and Steel Company, 3000 tons.

We learn from a well-informed gentleman that the stocks of pig iron on hand at the furnaces in Missouri are about as follows: Iron Mountain, Irondale and Pilot Knob, 25 000 tons; Scotia, previous to the sale, about 6000 tons—now making 1000 tons a month; Moselle, 4000 tons; and about 5000 tons scattered. The South St. Louis Company's furnaces light up to-day.—*Railway Review*.

Cleveland.

April 12, 1875.

Specially reported by Messrs. C. E. BINGHAM & Co., dealers in pig iron and iron ore;

No. 1, Lake Superior Charcoal	33 00@....
No. 2, " "	32 00@....
No. 3, " "	33 00@....
No. 4, " "	34 00@....
Nos. 5 and 6 "	35 00@....
No. 1, Bituminous foundry	30 00@ ...
No. 2, " "	28 00@....
No. 1. " Gray Forge	26 50@....
American Scotch, No. 1, Cherry Valley	32 00@....
" " No. 2	28 00@....
No. 1, Massillon	31 00@....
B—1, "	29 00@....
No. 2, "	27 00@....

Indianapolis, Ind.

April 12, 1875.

Specially reported by NELSON KINGMAN, broker and dealer in pig iron, etc.

Trade very dull at prices named below.

New Rails at mill	$56 00@58 00
Old Rails "	28 00@30 00
Hanging Rock Charcoal Pig No. 1 foundry	29 00@32 00	—4 mos
" " " " " 2 "	27 00@30 00	—4 mos
" " " Mill	25 00@28 00	—4 mos
Car Wheel C. B	45 00@50 00	—4 mos

STONE COAL.

Indiana No. 1 Foundry pig Red Short	30 00@33 00	—4 mos
" 2 " "	28 00@30 00	—4 mos
" 1 Forge " "	....@	—4 mos
" 2 " "	....@	—4 mos
Ohio No. 1 Foundry pig Cold Short	28 00@30 00	—4 mos
" 2 "	26 00@29 00	—4 mos
" Mill	25 00@28 00	—4 mos
" No. 1 Foundry, Neutral	30 00@34 00	—4 mos
" No. 2 " "	28 00@30 00	—4 mos
Merchant Bar	2 35c.—	3 mos
1st quality C. H. No. 1 Boiler Plates, per lb	5½c.—	3 mos
1st " Com. Sheet, for No. 24, W.G. "	4 c.—	3 mos
1st " Charcoal Sheet " " "	6 c.—	3 mos
Best Bloom Galvanized Sheet, discount 20 per cent	—cash.
2dquality " " " 30 "	—cash.

f. o. b. in Indianapolis.

Louisville.

April 12, 1875.

Specially reported by Messrs. GEORGE H. HULL & Co.

The market is quiet, but without indications of any change in price.

The usual time, 4 months, is allowed on the quotations below.

HOT BLAST—CHARCOAL.

No. 1 foundry, from Hanging Rock Ores	$28 00@29 00
No. 2 " " "	26 00@27 00
No. 1, Mill, from " "	25 00@ ....

No. 1, foundry, from Alabama, Georgia and Tennessee ores	26 00@27 00
No. 2, foundry, from Ala., Geo'a and Tenn. ores	25 00@26 00
No. 1, Mill, from " " " " "	25 00@ ....

HOT BLAST—STONE COAL AND COKE.

No. 1, foundry, from Hanging Rock ores	27 00@28 00
No. 2, " " " " "	25 00@26 00
No. 1, Mill, " " " "	24 00@25 00
No. 1, foundry, from Ala., Geo'a and Tenn. ores	26 00@27 00
No. 2, " " " " "	25 00@26 00
No. 1, Mill, " " " "	24 00@25 00
No. 1 foundry, from Missouri ores	28 00@29 00
No. 2 foundry, from Missouri ores	27 00@28 00
No. 1 Mill, from Missouri ores	27 00@28 00

COLD BLAST—CHARCOAL.

Car Wheel from Hanging Rock ores	40 00@50 00
" " Tennessee "	35 00@37 00
" " Alabama and Georgia ores	38 00@40 00
" " Kentucky ores	30 00@42 00

Pittsburgh. April 13, 1875.

Specially reported by A. H. CHILDS, Esq., commission merchant, for the sale of pig iron, blooms, ore, etc.

Pig iron is very dull, and will doubtless remain so, until work is resumed by the mills. Prices, however, are well sustained in spite of the long continued lockout, which seems to indicate that bottom has been touched, and that some improvement may be looked for when mills get started again.

Quotations are :

No. 1 foundry	$26 00@28 00—4 mos
No. 2 foundry	24 50@26 00—4 mos
Gray forge	23 00@24 00—4 mos
White and mottled	22 00@23 00—4 mos

The *American Manufacturer* of Wednesday, April 15, says :—There has been no change in the status of the pig iron trade since the date of our last report, and furthermore, it is not to be supposed that there will be as long as the lock-out continues. Trade, so far as our market is concerned, is virtually suspended; it is true, one of the smaller mills has been started up, but this will not be a drop in the bucket. At the writing of our last report, rumors were flying that the backbone of the lock-out had been broken, that other mills had concluded to follow the example set by the Keystone, but, as we then suspected, these expectations have not been realized, and manufacturers are more determined not to start up until the puddlers conclude to accept $4.50 for boiling, or the price of manufactured iron appreciates sufficiently to enable them to pay the rate demanded by the puddlers. This is the whole matter in a nut-shell. As already intimated, there is no demand for raw iron of any consequence ; even the foundries are not buying as much as they usually do at this season of the year, as the stoppage of the mills causes a scarcity of work in this branch of business also. However, the producing interest generally is hopeful in regard to the future, confident that when the mills start up there will be an active demand, and they are hopeful in view of the fact that the supply of standard forge is not large, of being able, when trade does open up, of obtaining better prices.

The Puddlers Strike Ended.

PITTSBURGH, Pa., April 15.

In accordance with the action of the Iron Association at their meeting of last night, a number of the principal firms resumed active operations to-day, while others are actively engaged in preparing to start up, so that within a week or ten days all will doubtless be at work. The following is the resolution which declared the lock-out broken, and which was unanimously agreed to. After a preamble, setting forth the facts that, notwithstanding there has been no visible improvement in the price of iron, and the representations which were made to the puddlers at the commencement of the difficulty apply with equal force at the present time, several firms, whose coöperation had been depended upon, had, for certain reasons, started their furnaces at $5 50 per ton, it was resolved, that, in view of their action, and the fact that Western mills are running and taking the trade which largely belongs to Pittsburgh, we deem it inexpedient to longer continue the suspension of our mills, and that we all, or as many of us as desire, resume work at $5 50 per ton.

San Francisco. April 1, 1875.

From the *Commercial Herald.*

There is a continued and increasing demand for ores of various kinds for export, and this branch of our trade is steadily expanding, particularly as low freights and abundance of tonnage is obtainable. The *Great Admiral*, from Liverpool, brought 159 tons pig iron. The *Port'and*, from Oregon, brought down 141 tons scrap iron for the rolling mill. The general market for iron, steel, lead, etc., is without important change, and no large sales to record. The consumptive demand of pig iron is steadily increasing on this coast.

METALS.

NEW YORK, April 16, 1875.

Gold Coin.—During the week past, gold has ranged from 114⅞ to 115⅞, and closed yesterday at 115⅛.

Bullion.—Fine silver bar is quoted at $1 25⅛@1 26⅛ ; gold, per ounce, and fine gold bar, at par ($20 67, gold, per ounce) to ¼ per cent. premium.

Copper.—There has been a little more doing since our last, but consumers have not entered the market largely. There have been sales aggregating from 300,000 to 500,000 lb. at 22c.@22⅛c., and from 50,000 to 100,000 lb. for delivery in early May, at 23c. The market is very firm, 22⅜c.@22¾c., with 22½c. bid. The London market was quoted yesterday, at £82 for Chili bars. We note an additional export of 112,500 lb. to Hamburg. The stock in this market is light, and concentrated in few hands—higher prices are looked for. Messrs. JAMES & SHAKSPEARE, under date of London, May 2d, say :—"Bars are steady at the rates quoted last week ; a few transactions were reported in good ordinary brands at £80 cash, also at same figure with fixed prompt of three months, the seller thereof having a bad opinion of the future, and being willing to back their views by sales for forward delivery at the rates now ruling for spot parcels ; where buyers required the option of taking up the stuff any time within the prompt they have been compelled to pay a premium of 10s. per ton. A small trade has been done in picked marks at £80 10s. ; best b ands at £81 and £81 10s. ; all cash terms. The market closes steady at these prices, and though buyers are few, sellers thereat are equally wanting. It is to be noted that a somewhat long-standing error has existed in the returns of the Havre stock of bars, the figures given during the last few months having been about 500 tons below the quantity actually lying there ; this is now corrected, but the actual deliveries of the month are therefore greater by 500 tons than those which have apparently taken place, according to the statistical figures." The actual stocks estimated in pure copper on the 1st inst., in Liverpool, Swansea, London and Havre, were 23,175 tons ; Chili chartered and afloat 9363 tons ; total, 32,568 tons. On March 1st., the actual stocks were 21,792 tons ; Chili chartered and afloat, 10,552 tons ; total, 32,344, which nominally shows an increase of 224 tons, while it really has been a decrease of 276 tons.

Tin.—The market for this article continues very quiet. The quotations are, Straits 20¼c.@20⅜c. gold, refined 20¼c.@20½c. ; L. & F. 19¾c. ; Banca 24½c. By cable, yesterday, in London, Straits were quoted at £86. Messrs. JAMES & SHAKSPEARE, under date of London, April 2d, say : "In English no change has taken place. Foreign descriptions improved about 1s. per cwt. in the early part of the week, owing to further speculative purchases of Straits being made up to 9 lbs. per cwt. both for cash and arrival. When the day of the Dutch sale approached buyers suspended their operations, and the result being scarcely so favorable as had been generally expected, they withdrew from the market, and we closed yesterday at a fall of 3s. from the highest point, with sellers rather than buyers at our list prices." There is not much doing in tin plates in a large way, but the aggregate in a small way is considerable. We quote charcoal tins at $9 75, gold ; charcoal ternes $8 75 ; coke tins $7 75@$8 ; and coke ternes $7 25@$7 50.

Lead.—Sales have been in a very small way, and will not aggregate over 75 tons at about 5 85c. There are 100 tons Selby, on dock, offering at 5 82½c., without finding a buyer. Foreign is quoted nominally at 6¼c.@6½c. Western is reported to have advanced from the quotations of last week and is now $6 85@$6 90 currency, delivered here. London advices of the 2d, say :—"Lead continues so unsettled that it is still impossible to give any accurate quotations, but the low rates now ruling are apparently beginning to attract attention."

Spelter and Zinc.—The market for spelter is very quiet. The nominal quotation is 7c. currency for Domestic, although there is some available stock offered at 6.90c. A combination has been formed among the Western producers, but although it is apparently in effect at the present moment, yet there is considerable doubt expressed of its being maintained. There is no foreign spelter in the market, and none to arrive. Sheet zinc is quiet at 9c.@9¼c. gold.

Antimony.—The London market is now quoted at £55@£56, and holders in this market are a little more firm, asking 12½c.@13c.

Quicksilver.—This market is very unsettled, sales for export have been made at $1 per lb. The London market is quoted at £14 per flask.

FINANCIAL.

New York Stocks.

April 14, 1875.

A decided improvement has transpired in prices of stocks, as compared with our last quotations. The aggregate sales are very much increased over those reported last week. This is principally due, however, to the remarkable activity in the Quicksilver Mining Company's shares, caused by rumors of the serious illness of the President of the Company, Mr. DREW. Over 7000 shares of this stock was thrown on the market on the 12th inst., the price declining from 22½ to 18¾. The stock recovered on the following day on contradiction of the rumors of Mr. DREW's indisposition and the presentation of the following favorable report.

"The Directors of the Quicksilver Mining Company had a meeting this afternoon. The committee appointed to examine the securities of the Company reported that they had made a thorough investigation, and found that it had $450,000 loaned on call, on first-class mortgages and ample margin. The Committee consists of Messrs. BANCKER and BAYLIS. The report was accepted."

The following stocks were sold at auction to-day at the prices annexed: 50 shares New Jersey Central Railroad at 113; 150 shares People's Gas Light Company, Albany, N. Y., (par $100,) 45½; 44 shares Harlem Gas Light Company, (par $50,) 29¾.

Quotations are as follows:

	Highest.	Lowest.	Closing.
Pennsylvania Coal Co.	—	—	—
Consolidation Coal Co.	—	—	47¾
Spring Mt. Coal Co.	—	—	—
American Coal Co	—	—	—
Mary'and Coal Co.	—	—	19
Cumberland Coal and Iron Co.	—	—	—
N. Y. & Nova Scotia Iron Co.	—	—	—
Del., Lack. & West. R.R. Co.	116	113¾	115
New Jersey Central R. R. Co.	113¾	112	112¾
Delaware and Hudson Canal Co.	118½	116	117¾
Quicksilver Mining Co. prefrd.	30	27½	30
" " " Common	23	18¾	21¾
Mariposa Land & Mining Co.	5	3	5
St. Louis & Iron Mountain R. R.	23	17	23
Wilkes-Barre Coal Co.	—	—	—

Sales for the week, ending April 14th, inclusive, were as follows :

	Shares.	Price.
Del., Lack. and W. RR.	3,542 at from	113½ to 116
Del. and Hudson Canal	268 "	116 " 118½
New Jersey Central RR.	1,004 "	112 " 113¾
Quicksilver Mining Co.	8,434 "	18¾ " 23
Consolidation Coal Co.	100 "	47¾ " ....
Mariposa Land & Mining Co.	1,450 "	3 " 5
Maryland Coal Co	58 "	19 " ....
St. Louis & Iron Mountain R. R	1,105 "	17 " 23
Spring Mountain Coal Co	.... "	.. " ....
Quicksilver Mining Co., prefd.	1,000 "	27¾ " 30
Pennsylvania Coal Co.	.... "	.. " ....
American Coal Co.	.... "	.. " ....
Total Sales	16,961 shares.	
Sales for the week previous	8,110 "	
Increase	8,851 "	

The following are the sales of bonds for the same period :

	Amount.	Price.
Del., Lack. & W. RR. convertible,	$10,000 at from	116 to ....
N. J. Central RR. 1st consolidated mortgage bonds	86,000 "	105 " 105⅛
St. Louis & Iron Mount'n 1st Mtg bonds,	.... "	.. " ....
St. Louis & Iron Mountain, 2d Mtg. bonds	.... "	.. " ....
N. J. Central 2d Mtg.	500 "	102½ " ....
" " 1st Mtg. N.	6,000 "	115 " ....
Del. & Hudson Canal, 1st Mtg. Reg. bonds, 1891	.... "	.. " ....
Del. & Hudson Canal, 1st Mtg Reg. bonds, 1891	.... "	.. " ....
Del. Lack. & W. R. R., 2d Mtg.	.... "	.. " ....
C. & O. R.R. 1st Mtg. Coupon	.... "	.. " ....
Total Sales	$102,500	

Philadelphia Stocks.

April 13, 1875.

The Philadelphia Stock Market has been generally quiet and steady during the week. Stocks closed firm at a slight advance on our quotations of last week. The transactions in bonds have been very large during the week, amounting to over $100,000, at slightly improved quotations, closing firm. The following various securities were sold at auction to-day at the prices annexed: $5000 L. C. & Nav. Co., 101⅛@101½; $500 R. C. & I. C. 7s Coupons at 100; $2000 L. V. R. R. 6s Coupons, 105¾; $5000 R. C. & I. Co. 7s Registered, 90¾; 50 shares of the Pennsylvania Steel Co., 69¾; 125 shares Connellsville Gas Coal Co., 62½. We note recent quotations of the Northern Liberties Gas Co. at 28¾.

The Lehigh Valley Railroad gives notice that the thirteenth and last instalment on new stock, being $5 per share, will be due and payable during April, and parties desiring to participate in future dividends on full paid shares are then required to pay all balances due on instalments, and surrender their receipts, when certificates of stock will be issued. Parties wishing to apply the April dividends to the payment of their instalments can do so at any time during April.

Quotations are as follows :

	Lowest.	Highest.	Closing.
Reading R. R. Co.	56½	56⅝	56⅝
Lehigh Valley R. R. Co.	62¾	63⅛	63
Little Schuylkill R. R.	—	—	49½
Catawissa R.R.	—	—	21¾
" " Preferred	—	—	43¾
" " New Preferred	—	—	39½
Huntingdon and B. T. R.R.	—	—	8
" " " " Preferred.	15¼	15¾	15¼
Minehill R.R.	—	—	53½
Lehigh Coal and Navigation Canal	51	51¼	51¾
Morris Canal	—	—	50½
" Preferred	—	—	128
Pennsylvania Canal	—	—	—
Schuylkill Navigation Canal	—	—	7¾
" " Preferred	—	—	15
Susquehanna Canal	—	—	7
Westmoreland Coal Co.	—	—	86
Buck Mountain Coal Co.	—	—	..
Cambria Iron Co.	—	—	17½
Locust Mountain Coal Co.	—	—	—
Emaus Iron Co.	—		30
Crane Iron Co.	—		

The following are the aggregate sales of stocks for the week ending April 13:

	Shares.		Price.		
Reading Railroad	2,438	at from	56½	to	56⅝
Lehigh Valley RR. Co.	544	"	62¾	"	63⅛
Little Schuylkill RR.	80	"	49⅞	"	—
Catawissa RR.	300	"	21½	"	—
" " preferred	318	"	43¾	"	43⅞
" " new preferred	116	"	39¼	"	39⅜
Huntington & B. T. R. R.	....	"	—	"	—
Huntington and B. T. RR., p'f'd.	104	"	15⅝	"	15¾
Minehill RR.	....	"	—	"	—
Lehigh Coal and Navigation Canal	6,081	"	51	"	51¼
Schuylkill Navigation Canal	324	"	15	"	—
" " " p'f'd	....	"	—	"	—
Morris Canal, preferred	....	"	—	"	—
usquehanna Coal Co.	....	"	—	"	—
Cambria Iron Co.	100	"	17½	"	—
Pennsylvania Canal	....	"	—	"	—
Susquehanna Canal	....	"	—	"	—
Emaus Iron Co.	....	"	—	"	—
Buck Mountain Coal Co	....	"	—	"	—
Total sales	10,405	shares.			
Sales for the week previous	13,584	"			
Decrease	3,179	"			

Sales of the various bonds for the period under review have been as follows:

	Amount.		Price.		
Reading RR. 6s, 44, 80	$3,000	at	102½	to	....
Catawissa RR., new 78	500	"	104¾	"	....
H. and B. T. RR., 1st mortgage, 78	1,000	"	104	"	....
Lehigh convt. gold loan	....	"	..	"	....
Pa. and N. Y. Canal, 78	....	"	..	"	....
Schuyl. Nav. 6s, '82	3,210	"	79¾	"	80
L. V. RR. 6s, coup.	....	"	..	"	....
H. and B. T. 1st Con. bonds	10,000	"	56½	"	57
R. C. and I. Co. irregular mort. bonds, Hill Tract	....	"	..	"	....
Lehigh Nav. 6s, 1884	1,345	"	100¼	"	101
Reading RR. debenture bonds	3,000	"	80	"	....
" " R. G. M. 7s, coup.	....	"	..	"	....
" " new convertible 7s	11,400	"	107	"	107⅛
Reading C. and I. Co. debenture bonds	....	"	..	"	....
Reading C. and I. Co. mort. bonds, Tamaqua Tract	4,000	"	90	"	....
Reading C. and I. Co. mort. bonds, St. Clair Tract	....	"	..	"	....
R. C. & I. Co., Wetherill tract	....	"	..	"	....
" " " " Locust Mountain Summit Improvement tract	....	"	..	"	....
R. C. & I. Co. Helfenstim tract	....	"	..	"	....
Lehigh Valley RR. 6s, registered	....	"	..	"	....
" " " 78	1,000	"	108	"	....
Lehigh Coal & Nav. Co. 6s, gold loan	56,000	"	101½	"	102
" " " " 6s, RR. loan	2,000	"	101	"	....
Schuylkil Nav. 6s, '95	2,000	"	79½	"	....
" " 7 per cent. boat loan	7,700	"	93	"	....
" " 6s, '72	220	"	95	"	....
" " Div'd scrip	....	"	..	"	....
R. C. & I. Co., Glentworth tract	....	"	..	"	....
Chesapeake & Delaware Canal, 6s	....	"	..	"	....
Susquehanna Canal, 6s	3,000	"	78	"	....
Pennsylvania Canal, 6s	7,000	"	70½	"	....
Shamokin Valley & Pottsville R.R., 7s	....	"	..	"	....
Allegheny Valley 7 3-10s	3,000	"	94	"	....
" " " Eastern Exte'n.	....	"	..	"	....
Del. Div. Canal, 6s	....	"	..	"	....
Total Sales	....	$119,375			

Gold and Silver Stocks.

SAN FRANCISCO, April 14, 1875.

A decline of $6 per share in the Consolidated Virginia Mining Company is the only exception to an advance of the San Francisco Stock Market. The tendency of the market during the week has been to gradually advancing figures, the market closing firm at our quotations. An assessment of $5 per share is announced by the Raymond and Ely Mining Company, delinquent May 10.

Quotations, April 14, 1875:

Gould & Curry	19	Raymond & Ely	49
Savage	131	Eureka G. V.	8
Chollar Potosi	64	Best & Belcher	53
Ophir	100	Kentuck	18
Hale and Norcross	44	Meadow Valley	8
Crown Point	41	Alpha	23
Yellow Jacket	87	Sierra Nevada	14
Belcher	37	Union Consolidated	8
Imperial	9	Mexican	27
Consolidated Virginia	447	Caledonia	21
California	68	Silver Hill	11
Overman	61		

Copper Stocks.

BOSTON, April 15, 1875.

Copper stocks are firm at slightly advancing figures. Transactions are light. We note the following sales during yesterday's operations of the Board: 125 shares of Franklin at $11 per share; slight transactions in Calumet and Hecla at our quotations; 400 shares of Rockland at our quotations; and 200 shares of the Superior Mining Company at 22½c. per share. Pewabic sold in small lots at 7½ to 7¾, and Quincy at 37¼ to to 37½; Allouez at 8¾ to 9 per share, respectively.

Quotations are as follows:

Allouez	9½	National	—
Calumet and Hecla Co.	147	Phœnix	13
Copper Falls	8½	Quincy	37
Central	25	Ridge	6
Franklin	—	Rockland	1¾

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American Institute of Mining Engineers.

OFFICIAL BULLETIN.

Announcements to Members and Associates.

I. The ENGINEERING AND MINING JOURNAL, which is the Organ of the Institute, and contains its proceedings, transactions and notices of meetings, will be sent to each Member and Associate on the payment of his annual dues. Back numbers cannot, as a rule, be sent.

II. Dues (ten dollars per annum) are payable on election and at the annual (May) meeting. Members and associates elected at the February meeting pay ten dollars only to May of the following year. Remittances should be made, as far as possible, by P. O. Order, payable to the Secretary.

III. Blank proposals for membership can be had on application to the Secretary.

IV. The second volume of Transactions has been mailed to all home members and associates not in arrears. Any member who failed to receive his copy will please notify the Secretary promptly. The Institute is not responsible for the loss of the volume in those cases where members have changed their residences and have omitted to inform the Secretary. Volumes I. and II. will be sent, post-paid, to non-members, at five dollars each.

V. Members are earnestly requested to inform the Secretary promptly of any change of address.

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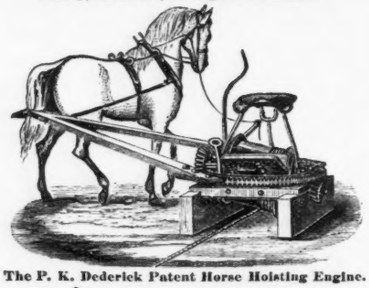

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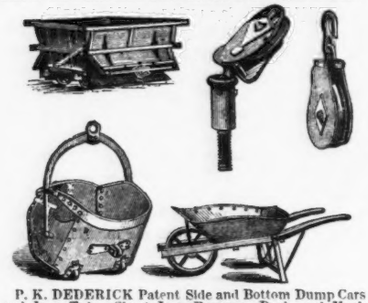

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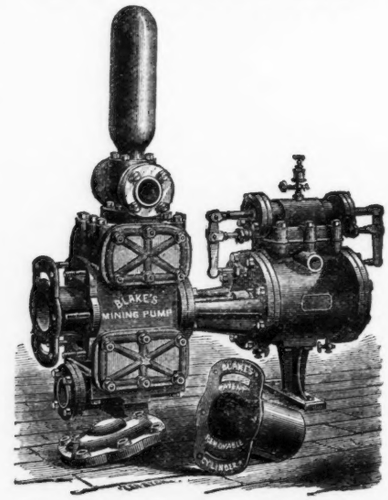

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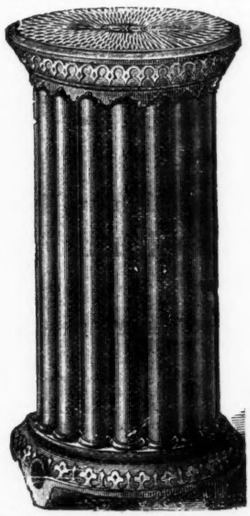

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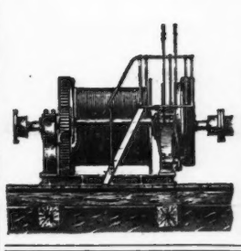

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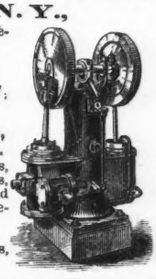

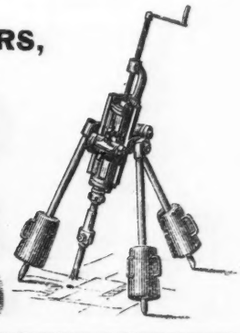

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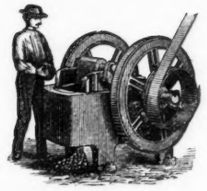

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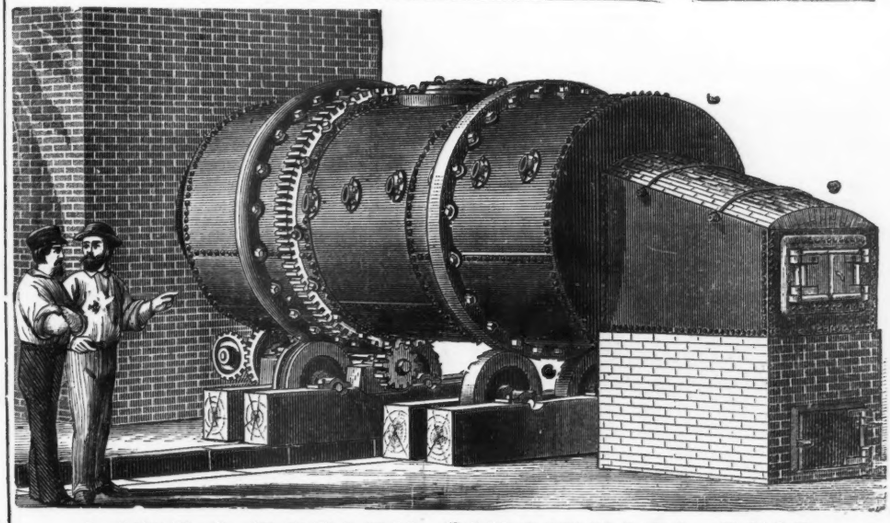

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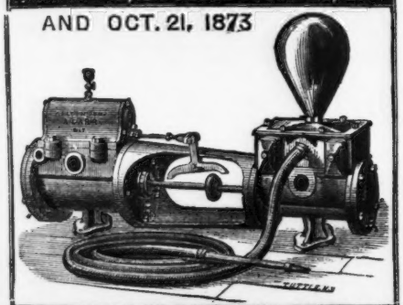

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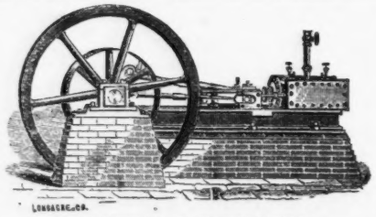

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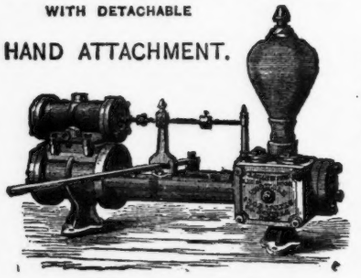

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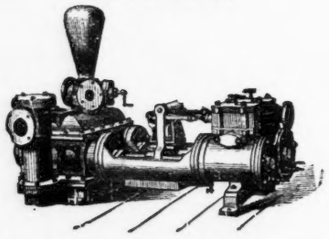

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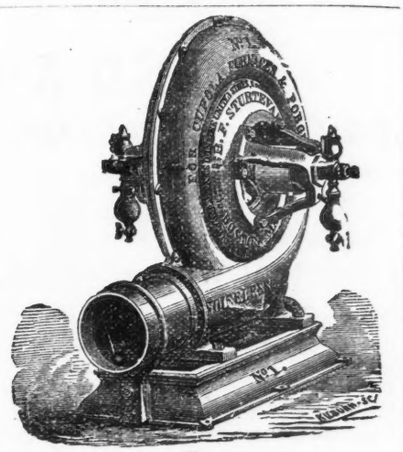

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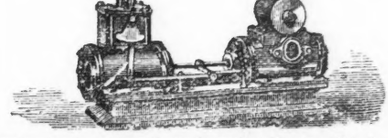

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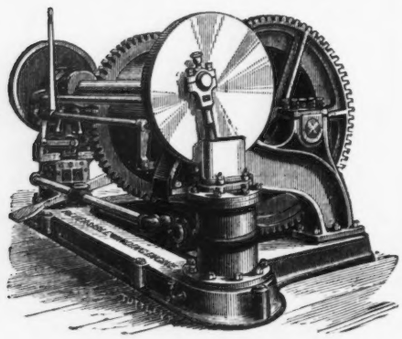

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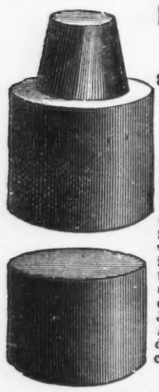

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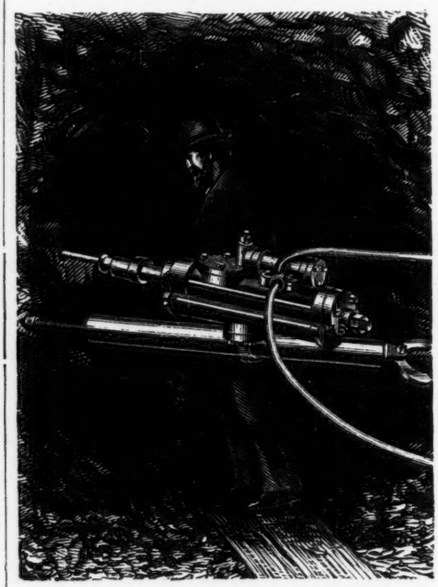

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